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ABSTRACT

This study of Bolivia's National Revolution of 1952 illustrates the effects of a peasant revolution on inequality and status inheritance. It was hypothesized that when an exploited peasantry revolts and overthrows the traditonal elite, peasants would be better off because inequality and status inheritance would decline as a result of the disappearance of the top levels of the stratification system. Also, inequality and status inheritance might eventually exceed their prerevolutionary levels because the revolution provides new opportunities for those with education, ability, luck, or other resources. In this study, data were taken from census tracts, a survey of 1,130 heads of household in six rural areas, and extensive anthropological reports on each area. A model distinguishing between types and extent of inequality and status inheritance before and after revolution was constructed. Findings indicated that although the standard of living rose for most rural Bolivians as a result of the 1952 revolution, those who had advantages before the revolution usually maintained their advantages afterward. Significant advantages included educational background and family's educational status. The conclusion is that inequality and status inheritance re-emerge after revolution because revolutionary liberation allows previously exploited groups to make fuller use of human capital, physical capital, and resources. (Author/DB)

REVOLUTION AND THE RE-BIRTH OF INEQUALITY

THE BOLIVIAN NATIONAL REVOLUTION*

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REVOLUTION AND THE RE-BIRTH OF INEQUALITY

1. ABSTRACT

This paper offers a verbal theory and an explicit mathematical model of a peasant revolution's effects on inequality and status inheritance and tests this theory with extensive data on Bolivia's 1952 revolution. We predict that when an exploited peasantry revolts and overthrows the traditional elite: 1) In the short run, peasants are better off. Both inequality and status inheritance decline. But human capital becomes more valuable and revolution does not benefit its poorest supporters as much as those who were better off before. 2) In the long run, peasants still benefit. But revolution provides new opportunities for those with education, ability, luck or other resources. Because of this, economic inequality, educational inequality, and status inheritance grow steadily among the peasantry. In many circumstances, inequality and status inheritance will also grow in the society as a whole, eventually exceeding their pre-revolutionary levels.

We test this theory with data on the Bolivian revolution of 1952. It involved a violent and fundamental restructuring of one of the world's most backward societies, destroying at one stroke a system of virtually feudal exploitation that went back to the Spanish conquest of the 16th century. We have a vast body of quantitative and qualitative data with which to test our theory. The data, from six diverse rural areas, include an extensive head-of-household survey (N = 1,130), complete censuses, and intensive anthropological reports on each town. To have such data on a society which has just undergone a revolution of this magnitude is, of course, extremely rare. The data clearly and strongly support our theory.

2. THEORY: REVOLUTION AND THE RE-BIRTH OF INEQUALITY

Probably the most shattering and dramatic transformation of human society is the violent overthrow of traditional elites by a revolution of the oppressed masses. Most have occurred in the mainly rural, peasant dominated societies in which the majority of mankind has lived. Local landlords have been dispossessed and chiefs deposed ever since exploitative governments arose in advanced agrarian societies. Large scale peasant revolutions appear throughout history, in the Peloponnese in 227BC, Flanders in 1323, England in 1381, France in 1789, Mexico in 1910, Russia in 1917, China beginning in 1921, Bolivia in 1952, Cuba in 1958, and elsewhere. For the old elite, the consequences of a successful revolution are clear. But for the mass of ordinary people they are not. Revolutions generally promise peasants justice and at least some relief from rent, taxes, usury, and traditional restrictions on their movement. They surely benefit from that and, at least in the short run, from the more open and equalitarian society that results. But whether some benefit more than others, and why, is unclear. The long term effects are even less clear. Does equality endure or does inequality re-emerge, perhaps in new and more virulent forms? Does social mobility grow or decline? Who benefits from the forces unleashed by revolution and how? In this paper we propose a theory about revolution's effects on inequality and status attainment. We show that, in the short run, a revolution can be expected to reduce economic inequality and status inheritance, as anticipated, but also to benefit its well-to-do supporters more than its poorer ones and to make human capital more important for all. In the long run peasants will still be better off but stratification re-emerges. Economic inequality and status inheritance grow steadily, in some circumstances eventually exceeding their pre-revolutionary levels. We first present the theory verbally and then, in the last section, develop an explicit mathematical model of the underlying process.

Scope Our theory deals with the predominantly rural, pre-modern, peasant[1] dominated societies in which most revolutions occurred. We claim that it applies to any revolution where (1) a politically and economically dominant traditional elite was able to expropriate a large fraction of the surplus produced by peasants (e.g., by

control over land, forced labor, discriminatory taxation, usury, or through monopoly privileges in agriculture, trade or government) and (2) the revolution liberated peasants from their traditional exploitation (e.g., by destroying the old elite's economic privileges, reducing taxes or interest rates, redistributing land, allowing freer access to opportunities in farming and business, expropriating or destroying accumulated capital, or some combination of these). We call this combination of events a radical revolution.

The predictions about long term effects (Hypotheses 4 through 8) apply more generally to any social changes which reduce exploitation or increase economic opportunities. This includes economic 'revolutions' which liberate people from stifling restrictions or increase their productivity for technical reasons, specifically the gradual changes which destroyed feudalism, the industrial revolution, the green revolution in agriculture, the introduction of cash crops or a market economy in non-market societies, and the like. It also includes the political changes which increased opportunities for blacks and women in the United States, untouchables in India, Ainu in Japan, and other minorities.

We deal with the apolitical mass of the rural and small town population, deliberately excluding the revolution's political and military leaders, the revolutionary intelligencia, and other revolutionary elites. Nonetheless their ideology and the policies of the government they establish are extremely important. The peasants' goals will generally be what they regard as simple justice --- personal (or communal) control over their land, minimal taxation, and the right to sell their produce on the open market. That leads to a predominantly market economy with peasants (or peasant communities) functioning essentially as small, capitalist entrepreneurs accumulating income and property. In that case our model applies with full force. But the revolutionary elite may oppose this return to a classical peasant economy, instead pursuing more radical and collectivist goals. If successful this will mean, as Wolf (1966, 1969) and others have noted, the end of a conventional peasantry and the rise of a rural working class, usually employed in state owned communal farms. Our model

still applies to this case, but the changes will be slower and somewhat attenuated, in ways we specify.

SHORT TERM EFFECTS

Inequality

We are dealing with radical revolutions which, by definition, are ones which at least partly free peasants from their traditional exploitation and thereby improve their economic position at the expense of the traditional elite. Transferring resources from the rich to the poor clearly reduces inequality (as we have defined it[2]) in the society as a whole. That is, of course, typically one of the revolution's main goals. In practice, the redistribution is often extensive. Radical revolutions often redistribute land, the fundamental fixed asset in peasant societies, and hence redistribute income. They usually redistribute liquid capital as well, expropriating or destroying rents, savings, debts, pensions, and monopolies; this reduces inequality, more so in the rare cases where the proceeds are directly redistributed to the poor. In many revolutions the expropriation is partly inadvertant. Property is abandoned during the crisis and the collapse of the old government often leads to dramatic inflation which destroys the value of savings, salaries and rents; these are more damaging to the old rich. Taxes and rents which fall most heavily on the poor are often reduced or eliminated. In pre-capitalist societies, the main form of exploitation is often through labor taxes extracted by the state or by landlords, and their abolition increases the time peasants have to work for their own benefit, leading to further equalization (e.g., Burke 1971, pp. 317-333). In modern times, revolutionary governments usually establish new health, education and welfare programs which result in major transfers of resources to the poor and further reduce inequality.

Human capital In the short run we predict that radical revolutions will make human capital more valuable. In practice the range of opportunities for utilizing education, knowledge, technical skills and other forms of human capital increases greatly. 1) Especially in previously isolated and traditional rural areas, rapid changes in marketing and the expansion of the money economy upset traditional economic ar-

rangements and reward the adaptability, rationality and cosmopolitan orientations that education provides (e.g., Schuman et al. 1967). Literacy and elementary bookkeeping skills are valuable even in a very primitive market economy (e.g., Kelley and Perlman 1971, pp. 216-220). 2) New political and economic power creates new opportunities for cultural brokers and go-betweens (politicians, lawyers, expediters, etc.) to mediate between peasant communities and non-peasant society (e.g., Bailey 1963). This requires knowledge, contacts, and linguistic and political skills. Modern revolutions generally create numerous new positions in schools, health and welfare agencies, the government bureaucracy, and nationalized industry. Economic growth, a goal of almost all modern revolutions, expands the market economy and increases employment in professional, managerial and clerical jobs and in transportation (Moore 1966; Kuznets 1965). Success in these requires educational, technical and linguistic skills. 3) Educational credentials often become more important quite apart from any real connection with performance. Requiring fixed levels of education is an effective and convenient way of restricting access to jobs (Collins 1971), especially in the expanding bureaucracies. 4) In societies where there are several languages (or where the educated classes speak a different dialect) skills in the dominant language often become more valuable after the revolution. They give access to new opportunities in education and commerce and are useful in dealings with the bureaucracy. With increasing contact between urban and rural areas and the atrophy of the old landlord's role as intermediary, facility in the national language helps in dealing with the police, bureaucracy, merchants and employers.

These new opportunities will, we predict, make education, technical and linguistic skills, and other forms of human capital more valuable, giving a larger return in occupational status and income. Some will be able to take direct advantage of their skills by self employment, taking up more attractive and profitable opportunities than were available before the revolution. Employers will have to offer more to attract skilled employees, to match these new opportunities in self employment. Also, the growing number of jobs that require education and linguistic skills increases the de-

mand for skilled personnel and, since the supply can increase only slowly, skilled workers will use their improved bargaining position to extract better offers.

Who benefits? Radical revolutions benefit most of their supporters. But we predict that they do not benefit the poorest as much as those who already possessed human or physical capital. This is largely because human capital is so important in taking advantage of the new opportunities. Those with more, already better off before the revolution, have a greater advantage in the new bureaucratic, commercial and political jobs (e.g., in the Soviet Union, Khruschev 1970, pp. 18-21) and in commercial agriculture. In addition, there are typically substantial differences in the amount and value of land peasants work before the revolution, and they are often able to maintain or strengthen their customary rights afterward (e.g., in Bolivia, Carter 1964); with their surplus no longer expropriated by the traditional elite, they benefit more from their advantages.

Status inheritance

Because a radical revolution leads to the redistribution of wealth, we predict that it leads to less inheritance of status -- i.e., more pure social mobility[3] -- for those who came of age just after the revolution. Since many pre-revolutionary elite parents lose their wealth, they have less of an advantage to pass on to their children, whereas some poor parents gain new resources and have more to give theirs. So on the average there is less variation in the wealth different parents have to pass on to their children and hence less status inheritance.

But status inheritance will not disappear. Some economic inequalities are likely to remain after even the most dedicated and efficient attempts at redistribution. Human capital remains; education, literacy, technical and linguistic skills and the like retain or even increase their value and cannot be redistributed. The old elite and others who were better off before the revolution have more of these resources and are able to pass some of their skills on to their children. So an effective means of transmitting status from one generation to the next remains; in the short run a revolution will reduce status inheritance but not eliminate it[4].

Summary.

Hypothesis 1: In the short run a radical revolution produces a more equal distribution of physical capital and, for those coming of age just afterwards, less status inheritance.

Hypothesis 2: In the short run a radical revolution causes a shift in the basis of stratification, making human capital (education, knowledge, technical and linguistic skills, etc.) a more valuable source of occupational status and income.

Hypothesis 3: A revolution does not immediately benefit the poorest of its supporters as much as it benefits those who possess human capital or were able to retain physical capital.

LONG TERM EFFECTS

Stratification among peasants

A radical revolution allows peasants to obtain a higher return on their physical capital since, by definition, it reduces exploitation. 1) By reducing rents or taxes on land, it allows peasants to retain more of what they produce. The destruction of corvée labor obligations -- the crucial tax in many agrarian societies -- allows peasants more time to work their own land for their own benefit (e.g., an additional one to three days per week in medieval Europe and three or more days in twentieth century Bolivia; Pirenne 1936, p. 64; Burke 1971, p. 328). 2) Revolution is likely to reduce the costs peasants pay for goods and services by destroying traditional monopolies on trade, credit and justice. Monopolies allowed traditional elites to charge exorbitant prices; even where the revolutionary government makes no deliberate attempt to reduce prices, competition is likely to drive them down. 3) Prior to the revolution, peasants' opportunities are often restricted to the least profitable sectors of the rural economy. However, the destruction of serfdom, corvée labor, and other laws tying peasants to the land opens up new opportunities. They can sell their own produce and take up wage paying jobs in addition to agriculture, which in some cases increases their income dramatically (e.g., Burke 1971, pp. 318-331). Some become traders and merchant middlemen, replacing the old elite's commercial monopolies. 4) Economic change may have the same effects, with or without revolution. The introduction of new cash crops or new agricultural techniques, the opening of new markets, and the like all provide new and often

profitable opportunities. Ending economic discrimination against blacks, untouchables, Ainu, etc., opens up opportunities for them.

These new opportunities will, we predict, lead to greater economic inequality among peasant proprietors and the mass of the previously exploited population[5]. Even in pre-revolutionary times, peasants differ in their physical capital (e.g., size and quality of usufruct landholdings), in human capital (e.g., agricultural or linguistic skills, education, experience with the outside world), and in ability, diligence, motivation, luck and the like. By expropriating the surplus and restricting opportunities to use capital effectively, the old system prevented fortunate peasants from getting the full benefit from their advantages and so restrained the growth of inequality. Revolution removes the restraints, allowing them to take full advantage of their resources[6]. In the long run that creates steadily growing inequality among peasants and other previously exploited groups. The fragmentary evidence now available supports this prediction (Chevalier 1967, pp. 178, 180-184; Craig 1969, pp. 290-291; Lenin 1920, p. 339; Petras and Zemelman 1972, pp. xii, 95-97). This leads to what might be called the kulak stage -- the rise of a newly enriched sector of the peasant population and the emergence of an essentially capitalist rural stratification system[7]. Since fortunate peasants have increasingly large advantages to pass on to their children, we predict that revolution will, in the long run, also lead to steadily increasing status inheritance among them. The same reasoning applies to economic revolutions and to social changes that reduce exploitation. And in fact there is evidence that they both increase inequality (e.g., in agriculture following the green revolution, Havens and Flinn 1975) and status inheritance (e.g., among American blacks in the last decade, Hauser 1976).

Human capital In the long run a radical revolution leads to greater inequality in human capital among the peasantry and previously exploited masses. 1) Revolution provides additional reasons for acquiring human capital. Education, linguistic skills and other forms of human capital are always valuable and, as we argued, revolution if anything makes them more so. Peasants can expect greater benefits from education after

the revolution, since they have new opportunities to use it and they can keep more of what they earn. Investing in education therefore becomes more attractive on straightforward economic grounds (e.g., Mincer 1974; Burke 1971, pp. 324-330). 2) Modern revolutions supply the means. Whether from conviction or because of peasants' new political power, revolutionary governments generally expand the school system, making education available where it was not before. 3) Educational inequality increases because some children benefit more than others. Able and motivated children have an advantage. So do children from privileged families. Throughout the world, well educated, high status families are much more successful in getting their children educated (e.g., in tribal societies, Kelley and Perlman 1971; in socialist societies, Anderson 1976, Lane 1971, pp. 107-120; in industrial societies, Treiman and Terrell 1975); they provide encouragement and role models, teach linguistic and academic skills, force their children to work harder, and the like. Schooling is usually expensive, with both direct costs (fees, supplies, clothing, etc.) and often substantial indirect costs in income forgone (the student could otherwise have a job or work for his family); prosperous families can better afford these costs.

This growing inequality in human capital will, we predict, in the long run lead to greater economic inequality and more status inheritance among peasants. Since education and other forms of human capital are quite valuable, greater inequality in human capital leads to greater inequality in income and wealth. That, we argued, leads to greater status inheritance. Educational changes also increase status inheritance directly. As educational inequality grows among parents -- i.e. as the gap between well and poorly educated parents increases -- it becomes more of an advantage to be born into a well educated family.

Government intervention A revolutionary government can try to restrain these forces by limiting the private accumulation and inheritance of capital. Populist and middle class revolutionary parties are unlikely to have either the ideological justification or the dedicated cadre with which to do so, although many socialist and communist governments will make the attempt. But it is difficult to achieve. Expropriating large landowners, large capitalists and foreign investments and thereby securing the

"commanding heights" of the economy will not be enough since accumulation by the mass of upper peasants and educated middle class leads, we have argued, to inequality. To restrain them, private capital will have to be abolished throughout the economy. In practice this is usually accomplished by socializing the industrial economy, collectivising the land, and sometimes by the physical extinction of the kulaks. Many more people have something to lose from that and they are not without recourse. Small businessmen have money and the threat of withdrawing valuable services; the upper levels of the peasantry know they have much to lose; the educated middle class and party workers newly ensconsed in the bureaucracy will want to secure their advantage by accumulating wealth. To fully overcome this opposition requires from the party's cadres a level of commitment, dedication and resistance to temptation that is difficult to maintain over the years; it also requires an extensive and efficient bureaucratic apparatus which can extend its control to the very grassroots, something few societies have ever possessed. China's cultural revolution may, in part, have been an attempt to overcome this opposition and prevent the re-emergence of inequality (e.g., Yüeh 1976) but even in China the costs were great, opposition strong, and success uncertain; other examples are not easy to find.

But the abolition of private capital is not in itself enough to prevent the long term growth of inequality since much (indeed most) of it arises from differences in education, skills, language and other forms of human capital which are almost immune to redistribution. Human capital is crucial: to run even a moderately complex society requires an educated elite -- business, industry and government require a variety of administrative and technical skills, and even farming and small trading are greatly facilitated by literacy, bookkeeping and specialized technical skills. Ignoring these skills in favor of political or equity considerations is exceedingly costly (e.g., [illegible]schev 1970, pp. 18-21); to date only China has systematically and persistently attempted it after the revolutionary government was firmly established and the threat of counter-revolution past. Nor can governments effectively prevent human capital from being passed from one generation to the next without draconian changes in the family. The knowledge, values, culture and language skills acquired in elite homes

give their children an enormous and enduring advantage in socialist as well as capitalist societies (Anderson 1976; Duncan, Featherman and Duncan 1972, Chs. 3, 5, 6; Lane 1971, Ch. 5); discriminatory admissions policies for higher education and government can somewhat reduce the advantage but not eliminate it, save at enormous cost. Thus a revolution that is able to abolish private property will slow the long term growth of inequality and status inheritance but will not prevent it.

Stratification in the society as a whole

A radical revolution will, we argued, in the long run create more inequality and status inheritance among peasants and the previously exploited rural masses. Its effects on inequality and status inheritance in the society as a whole are less clear. But we will argue that they first decrease and then remain low for a period; in most circumstances they then increase steadily and, in some circumstances, eventually exceed their pre-revolutionary levels.

Economic development increases inequality. Even if everyone retains the same relative position, it increases the absolute size of the gap between rich and poor and therefore increases inequality as we have defined it[8]; if, for example, the introduction of new cash crops doubles everyone's income, it also doubles the gap between poor peasants and rich merchants, so the peasant has twice the obstacle to overcome if he is to live as well as a merchant and a peasant's son has twice the handicap to overcome if he is to catch up with a merchant's son. In addition, anyone -- townsman as well as peasant -- with physical capital, human capital, or other advantages will be better able to take advantages of the new opportunities opened up by economic development. That increases inequality both relatively and absolutely.

The benefits that revolution provides for peasants and the exploited rural masses will at first decrease inequality in the society as a whole. Peasants' income, wealth and human capital almost always begin well below the average for the whole society; the commercial and administrative sectors in rural towns and most urban groups are markedly better off to begin with. The revolution reduces exploitation, improving all peasants' economic position and moving them closer to the mean. That reduces inequal-

ity[9]. Most peasants go no further. But those with physical or human capital or other resources will continue to improve their position, especially if the revolution is one which produces economic development. As they draw closer to the mean, inequality continues to decline. But as they pass the mean in increasing numbers, inequality first stabilizes and then (depending on how many pass it and how far they get) may increase[10]. So there is a standard sequence following the revolution. Inequality first declines and then stabilizes. If peasants continue to improve their economic position, the declining phase lasts longer but eventually inequality begins to increase again and may exceed its pre-revolutionary level.

How far along this sequence a society gets depends not only on what happens to the peasants but on how high the mean is to begin with and how it subsequently changes. 1) Most pre-revolutionary peasant societies are very poor, with a small surplus extracted by a tiny elite. The average is low and, other things equal, that makes it easier to surpass; the society will then go through the sequence quickly, more often reaching the stage where inequality increases. In richer societies (e.g., Eastern Europe following the communist revolutions), peasants have further to go and the society passes along the sequence more slowly. 2) The average depends on what happens to the urban population and the post-revolutionary elite; that reflects the power and ideology of the revolutionary leadership, the society's economic and administrative capacity, international political and economic restraints, and a variety of other factors beyond the scope of our theory. Other things equal, where urban incomes are stagnant the society will pass along the sequence more rapidly, since it is easier for peasants to reach the mean. If urban incomes grow, there are conflicting tendencies. The improvement in rich peasants' positions tends to decrease inequality for a longer period (it takes longer to catch the growing mean) but poor peasants fall even further behind, which increases inequality. The effects on the society as a whole depend on the magnitude of these changes and the size of the groups involved.

There may be further redistribution after the revolution, which affects inequality. Particularly where there is no sustained economic growth, gains by rich peasants

are someone else's losses. If they gain entirely at the expense of the elite, there will be more equality. But in practice, their gains will most likely be at the cost of poor peasants and lower and middle classes in the towns. As rich peasants take over marketing, credit and middleman functions, they displace middle and lower class urbanites; liberated peasants compete for desirable urban jobs. Successful peasants will produce cash crops more efficiently, undercutting poor peasants' market positions and driving them off the land. When rich peasants begin to pass the mean, inequality will eventually increase so long as these gains are mainly at the expense of groups below the average (or, of course, if they are at no one's expense).

A revolution's effects on inequality in the society as a whole thus depend crucially on the speed of economic development, the economic position of urban groups and the post-revolutionary elite, and government policies toward accumulation. We predict that inequality will increase most dramatically when the revolution generates economic development (which directly increases inequality) and where the entire society was poor to begin with (since rich peasants exceed the mean sooner). Since modern revolutions in poor societies (e.g., Mexico in 1910, Bolivia in 1952) almost always promost economic development, we predict that they will eventually create more inequality than existed before the revolution unless governments take strenuous efforts to prevent it. The scattered evidence now available suggests that inequality does increase (e.g., Wolf 1956). We predict that economic revolutions -- the decay of feudalism, the industrial revolution, the introduction of cash crops and a money economy in premarket Asian and African societies, the green revolution in agriculture, etc. -- will in the long run cause greater inequality since they lead to economic development; the evidence indicates that they do (Kuznets 1965, pp. 275-277). In contrast, we predict that classical peasant revolutions in traditional societies where urban areas remain much richer than the countryside and no economic development results will reduce inequality (e.g., in the Peloponnese in 227BC, Punjab in the late nineteenth century). Changes in status inheritance in the society as a whole will, we predict, parallel changes in inequality for the reasons set out earlier.

Summary

Hypothesis 4: In the long run, peasants are better off after a radical revolution.

Hypothesis 5: By allowing them to more fully utilize their resources, in the long run radical revolutions set loose forces which tend to produce steadily increasing economic inequality among peasants.

Hypothesis 6: In the long run, radical revolutions produce increasing educational inequality among peasants.

Hypothesis 7: Among peasants, radical revolutions create forces which tend in the long run to produce more status inheritance both through economic advantage and through education.

Hypothesis 8: In the society as a whole, inequality and status inheritance will first decrease following a radical revolution, then stabilize, then (a) remain low where non-peasants remain well-off and there is no economic development in the countryside but (b) steadily increase and eventually exceed pre-revolutionary levels in poor societies where there is substantial economic development in the countryside.

FORMAL MODEL

Short term effects

We have defined radical revolutions as those which reduce the exploitation of peasants. Since peasants are poor and exploiters rich, that clearly reduces the standard deviation, our measure of inequality. For people coming of age shortly after the revolution -- before inequality has had a chance to re-emerge -- this decline in inequality should, we will show, lead to less status inheritance (i.e. more pure mobility). A detailed argument is given elsewhere (identifying reference, forthcoming). Briefly we assume that a son's (or daughter's) occupational status is determined only by his human capital (education, knowledge, skills in language, war, crafts, etc.), his physical capital (wealth, land, cattle, etc.), and by various other things (luck, strength, ability, etc.) which are uncorrelated with his father's occupational status. We assume that all relations are, to a reasonable approximation, linear and additive so that

$$(1)\quad STATUS_s = h\ HUMANCAP_s + w\ WEALTH_s + OTHER_1$$

where $STATUS_s$ is the son's occupational status, $HUMANCAP_s$ is the son's human capital,

$WEALTH_s$ is his wealth and other physical capital, h and w are constants, and $OTHER_1$ measures other factors. His human and physical capital are in turn determined by his father's human and physical capital and by ability, motivation, luck, and other factors uncorrelated with his father's occupation, i.e.

$$(2)\quad HUMANCAP_s = h_{fh}\, HUMANCAP_f + h_{fw}\, WEALTH_f + OTHER_2$$

$$WEALTH_s = w_{fh}\, HUMANCAP_f + w_{fw}\, WEALTH_f + OTHER_3$$

where $HUMANCAP_f$ and $WEALTH_f$ are father's human and physical capital, the h's and w's are constants, and the OTHER's measure other factors uncorrelated with father's capital or status. The correlation, $r_{fs,ss}$, between father's and son's occupational status, the usual measure of status inheritance, is obtained by substituting these in equation (1), multiplying both sides by father's status, summing over the whole population and dividing by N giving (where we have assumed without loss of generality that all variables are measured as deviations from their means):

$$(3)\quad r_{fs,ss} = r_{fs,fh}\frac{\sigma_{fh}}{\sigma_{ss}}\left(h_{fh}\, h + w_{fw}\, w\right) + r_{fs,fw}\frac{\sigma_{fw}}{\sigma_{ss}}\left(h_{fw}\, h + w_{fw}\, w\right)$$

where the subscripts fs, fh, and fw refer to father's status, human capital, and wealth respectively and ss to son's status. The OTHER's have dropped out since they are uncorrelated with father's status. All terms in (3) are positive since we assume that having capital is always beneficial (so the lower case constants are all positive) and that the correlations between father's status and his human capital and physical capital respectively are positive; we also assume that the range of occupations open to sons is fixed by the occupational structure, or at least changes only slowly, so that σ_{ss} is approximately constant. It follows directly that $r_{fs,ss}$ will be smaller -- i.e. there will be less status inheritance -- whenever human capital or physical capital is more equally distributed in the father's generation since that means σ_{fw} is smaller. That[12] gives the second part of Hypothesis 1. The converse, that increasing inequality in father's human or physical capital leads to more status inheritance, is used later in Hypotheses 7 and 8.

Hypotheses 2 and 3 follow from the familiar model of occupational attainment as a sorting process (Thurow 1975). Candidates for jobs differ in various ways (human

capital, wealth, ability, motivation, etc.) which make some of them more 'suitable' than others. Jobs also offer various rewards (money, prestige, interest, etc.) which make some more desirable than others. Getting a job is then like a marriage market; except for a good deal of luck and confusion, the most suitable candidates get the best jobs (they want those jobs and employers prefer them to less suitable candidates) and the less suitable candidates get the poorer jobs (the better jobs are already taken and the better candidates are already employed). Hypothesis 3 follows on the assumption that revolution doesn't change this basic process but simply provides new slots and removes the old elite from the top of the queue, opening up new places for everyone else. Hypothesis 2 essentially claims that revolutions produce changes in the kinds of jobs available and in the criteria for filling them -- education and linguistic skills becoming more important on both counts -- which make candidates with such skills more desirable to employers (or more successful in self employment) and hence able to obtain better jobs and higher pay.

Long term effects

We will develop a model of a radical revolution's effects on income and the accumulation of wealth, and hence on inequality and status inheritance. Hourly rates of pay for unskilled workers before the revolution, pay_u are determined by various production and supply conditions, employers' monopoly powers, geographic restrictions (which, e.g., prevent peasants from taking up trading and urban jobs or moving to high wage areas), and the like. We assume that wage rates also depend on human capital (HUMANCAP) and on motivation, ability, luck and the like (call them OTHER) which can to a reasonable approximation be combined into a single aggregate resource (HUMANCAP+OTHER) with wages proportional to it[13]. The return to this combined resource reflects both the economic return and the costs imposed by restrictions on the type and location of work peasants are allowed to undertake, employers' monopoly powers, and the like. Wage rates for all workers are then $\left(pay_u + pay_s \cdot (HUMANCAP+OTHER)\right)$, all workers receiving pay_u and skilled workers receiving a bonus proportional to their resources. For simplicity we assume that this is the same throughout the life cycle

but other reasonable assumptions (e.g., Mincer 1974, Ch. 1) would lead to the same qualitative conclusions. By reducing the costs imposed on pay_u and pay_s a revolution increases both components of workers' pay.

Earnings depend on the number of hours worked for pay. Yearly earnings, EARNED, will be hours worked for pay times the wage rate, less any per capita taxes (e.g., head taxes) or in all:

$$(4) \quad EARNED = hours\left(pay_u + pay_s \cdot (HUMANCAP+OTHER)\right) - headtax$$
$$= \left(hours \cdot pay_u - headtax\right) + \left(hours \cdot pay_s \cdot (HUMANCAP+OTHER)\right)$$

The second line separates earnings into a part that is the same for everyone (unskilled wages minus head taxes) and a part that depends on the worker's human capital and other resources. Labor taxes (common in quasi-feudal societies) simply subtract some hours from those worked for pay; taxes that are, taken all together, approximately a fixed proportion of income (e.g., some combination of progressive, flat rate, and regressive taxes) also in effect subtract working hours. Revolution in an exploited peasant countryside will reduce taxes, effectively increasing the number of hours worked for pay and hence increase earnings and the variance in earnings, i.e. increase inequality.

Wealth is simply accumulated savings from the past plus inherited wealth, both invested at interest. Assume that people save approximately a fixed percent (call it save) of both their wage income and the interest (call it int) they earn on accumulated capital. Then wealth in the n^{th} year of someone's working life, $WEALTH_n$, depends simply on their accumulated wealth from the past, $WEALTH_{n-1}$, on savings from interest, $save \cdot int \cdot WEALTH_{n-1}$, and on savings from the year's wage earnings, $save \cdot EARNED$, giving:

$$(5) \quad WEALTH_n = WEALTH_{n-1} + save \cdot int \cdot WEALTH_{n-1} + save \cdot EARNED$$
$$= (1 + save \cdot int)\, WEALTH_{n-1} + save \cdot EARNED$$

By induction, wealth at time n can be expressed as a function of inherited wealth, $WEALTH_o$, and the accumulated savings from each year in the past:

$$(6)\quad WEALTH_n = (1+save\cdot int)^n\, WEALTH_o + (1+save\cdot int)^{n-1} save\cdot EARNED + (1+save\cdot int)^{n-2} save\cdot EARNED + \ldots + save\cdot EARNED$$

$$= \left((1+save\cdot int)^n\, WEALTH_o\right) + \left(\frac{(1+save\cdot int)^n - 1}{int}(hours\cdot pay_u - headtax)\right) + \left(\frac{(1+save\cdot int)^n - 1}{int}\, hours\cdot pay_s\cdot(HUMANCAP+OTHER)\right)$$

The second line is obtained by summing the geometric series[14] and then substituting the earnings expression from (4) and simplifying. It gives current wealth explicitly in terms of the accumulated advantages from inherited wealth (first term), plus the accumulated savings everyone will have from their labor (second term), plus the accumulated savings from the bonus paid to workers with human capital and related resources (third term).

Total yearly income from all sources in the $(n+1)^{th}$ year, $INCOME_{n+1}$, depends on the same factors. It is simply the interest earned on the wealth accumulated in previous years plus the amount earned by working during the current year or, from (4)

$$(7)\quad INCOME_{n+1} = \left(int\cdot WEALTH_n\right) + \left(hours\cdot pay_u - headtax\right) + \left(hours\cdot pay_s\cdot(HUMANCAP+OTHER)\right)$$

The first term is the return from accumulated wealth, the second is the income everyone earns by working, and the third term is the bonus earned by workers with human capital or other resources.

A radical revolution increases peasants' wealth and income (Hypothesis 4). It reduces taxes (headtax is smaller afterwards or, for proportional taxes, peasants in effect have more hours to work on their own account); that increases the second component of both wealth and income. By destroying the old elite's monopolies, removing restrictions on geographic mobility, allowing peasants to take up a wider range of jobs, or the like it increases both pay_u and pay_s; that increases the second and third components of both wealth and income. New opportunities and incentives for peasants to invest in human capital increase the third component. Revolution may allow peasants to use their physical capital more effectively, which increases the interest rate and therefore increases all three components of wealth and the first component of income. Anything that increases wealth of course increases the first component of

income in subsequent years.

Inequality is the standard deviation of wealth (equation 6) or income (equation 7). It will be greater whenever any of the coefficients of the first component or the third component are higher[15]. Even when everyone benefits from an increase, people with inherited wealth, human capital or other resources will benefit more than others and inequality will increase. So an increase in the rate of saving or in the interest rate produces greater inequality in wealth (those who inherited wealth get a larger return from it and people with human capital get more from savings) and, in subsequent years, in income. An increase in the pay of skilled workers or in the number of hours worked for pay greatly increases inequality in wealth and income since those benefits go disproportionately to people with human capital and other resources. As we have seen, revolution increases all of these. With higher returns available on human capital, peasants have more reason to invest; the variance in human capital is likely to increase as well, if only because education depends on ability and family background. Both increase the variance in the third component of wealth and income, and hence inequality. Inequality also increases when the variance in inherited wealth goes up; more inequality among post-revolutionary fathers ensures that. These are the claims underlying Hypothesis 5.

Revolution makes investment in education more attractive by increasing the returns, pay_s, reducing the taxes paid on these returns, and increasing profits from investing them. Hence fathers devote more of their wealth to paying for their son's education and invest more time and effort in transmitting their cultural skills; sons more fully exploit their ability and other resources which enable them to acquire education (so in equation 2, h_{fh}, h_{fw} and $OTHER_2$ will be larger). Since son's abilities and father's human and physical capital are themselves unequally distributed (especially after the revolution), the variance in son's education (computed from equation 2) will increase. This is the claim made in Hypothesis 6.

Hypothesis 7 follows from Hypotheses 5 and 6 together with equation (3). Revolution increases inequality among fathers, i.e. σ_{fh} and σ_{fw}, and that increases status

inheritance.

Hypothesis 8 follows from a simple model. As a rough approximation we can imagine that there are four classes in the society as a whole -- peasants and other members of the rural masses who have no appreciable human capital, peasants et al., with human capital, the working and middle class population of the towns, and the urban elite -- and that within each class everyone has the same wealth and income. Suppose the classes have n_1, n_2, n_3 and n_4 members respectively and that the wealth of each member is w_1, w_2, w_3 and w_4 respectively. Then the average income (or wealth) in the society as a whole is simply the weighted average for all four classes. Income inequality is just the standard deviation of income, which is a simple function of the squared deviation from the mean, $\sum_i (n_i w_i - \text{mean})^2$. Before the revolution, all peasants are poor, the elite is rich and the town population is somewhere in between. Revolution makes the elite poorer and peasants richer, bringing everyone closer to the mean and reducing inequality. Peasants with human capital then begin to improve their positions steadily, which further reduces inequality when they are still below the mean, has little effect when they are near the mean, and eventually increases inequality if they rise above the mean. Whether they get that far depends on how high the mean was to start with, how much richer they get, and what happens to the mean while all this is going on. If the mean was low at the beginning, the revolution leads to steady economic development in the countryside (so peasants with capital continued to grow richer), and the town dwellers and urban elite's wealth did not grow, then many rich peasants will exceed the mean. Inequality in the society will increase and may eventually exceed its pre-revolutionary value, particularly when town dwellers and the elite are a small part of the total population. Without steady economic development and where there is a large gap between peasants and the rest of the society, inequality will remain low. These are the claims of Hypothesis 8. In other situations there are conflicting tendencies; the outcome depending on which are stronger. More complex models with more classes and wealth distinctions within classes lead to the same qualitative conclusions.

SECTION 3. DATA: THE BOLIVIAN NATIONAL REVOLUTION OF 1952

This section presents a quantitative study of the effects of a major political revolution on social stratification. The Bolivian National Revolution of 1952 involved a violent and fundamental restructuring of one of the world's most backward societies, destroying at one stroke a system which had exploited the peasant masses in almost feudal terms since the Spanish conquest in the 16th century. We have a vast body of quantitative and qualitative data on the revolution; the data, from six diverse rural areas, include a very extensive head-of-household survey (N=1, 130), complete censuses, and intensive anthropological field reports on each town. To have such data on a society which has just undergone a revolution of this magnitude is exceedingly rare and valuable. On the basis of these data, we will provide a rigorous, quantitative test of the theory presented in the last section and, in the process, provide a description of some of the effects of a radical revolution on the lives of ordinary people, a matter of considerable interest and about which little is known. We first present a description of the background and setting of the revolution, then a description of our data and methods, then an analysis of the revolution's effects on status inheritance, and finally an analysis of some other consequences of revolution.

BACKGROUND

Social and economic setting

The Bolivian National Revolution of 1952 was a profound political, economic, and social revolution in one of the most backward of third world societies. Prior to the revolution, Bolivia had a peasant subsistence economy with a small export mining sector; even by 1965 it had a gross domestic product per capita of only $132, second lowest in the western hemisphere (Paukert 1973). It was ruled by a white elite who, assisted by mestizos (cholos), ran the country for the Tin Barons and the leading latifundistas. Its pattern of land tenure was

probably the most unbalanced in Latin America; over 90 percent of the cultivated lands were held in estates of one thousand hectares or more, and these estates were owned by only 6 percent of the total number of landowners. The bulk of the population was in subsistence agriculture where 94 percent of the landowners owned only 8 percent of the total cultivated land.

Bolivia was also a typical example of an ex-colonial third world area with a small, white European-oriented elite ruling an exploited native mass. In this dual social system, almost half the nation spoke only non-European languages. Even the bilingual and Spanish-speaking half was only partly integrated into the society. Well over two-thirds of the entire population was illiterate. The majority of Indians were squatters on the large latifundias, getting use of usufruct land in return for providing the hacendado who owned the estate with free labor. In addition to this free labor tax, known as colonato, the Bolivian Indian and cholo agrarian mass (who made up over 70 percent of the active labor force) were also subjected to a tax of personal service, also based on their access to the hacendado's usufruct land. This system of personal servitude, known as ponqueaje, saw the exploitation of the landless peasants in almost classic feudal terms. They were required to provide almost unlimited service to the hacendado and his family.

Even free Indians living on their own communally owned lands were effectively exploited by the elite through direct government taxation. Special discriminatory taxes on coca, head taxes on landowning Indians, and finally excessive corvee labor obligations were used to tax the resources of those Indians beyond the reach of the private landowner.

Brutal and exploitative as the system was, it was fully supported by the State. Peasant protests and rebellions were ruthlessly suppressed, Indians were denied access to arms, and garrisons of federal troops were located in all the rural areas to enforce the will of the local white and cholo elite.

Given their large pool of free labor and the artificially high prices paid for farm products, the rural landowners were unwilling to invest in increased production, since they could secure adequate profits without investment of capital. Thus, while 72 percent of the economically active population by 1950 was still engaged in agriculture, agriculture accounted for only 33 percent of the gross national product (CEPAL 1958, p. 41). The backwardness of local agriculture was such that 19 percent of Bolivian imports by 1950 were for agricultural products, many of which were traditional subsistence crops consumed in the Andean highlands only.

What little industry existed in Bolivia by the time of the Revolution was of a minimal kind, being confined exclusively to light urban industries and semi-finishing of local agricultural products. This industry absorbed only 4 percent of the economically active population and accounted for only 9 percent of the GNP. Not only was manufacturing of minor importance to the internal economy in 1950, but it appears from almost all indicators that even in this sector there was a steady decline in productivity from peak production periods of World War II.

The heart of the national economy was the great tin mines but they only employed a fraction of the labor force, and had little linkage impact of multiplying effect on the rest of the economy. From the consolidation of the industry in the 1920's and 1930's, there had been an ever steadier concentration into the hands of the Big Three Companies (Patino, Hochschild, and Aramayo) and an increasing decapitalization as higher grade ores gave out and cheaper producers from Africa and Indonesia entered the market. Bolivian producers invested huge sums outside Bolivia after 1945 and the industry was declining by 1950.

Politics

Bolivia had a rather conventional type of 19th century liberal parliamentary regime until 1930. From 1880-1930 a series of liberal and conservative civilian

upper class parties had ruled the nation. But in the midst of the crisis of the Depression, desperate politicians had initiated war with Paraguay. The resulting Chaco War of 1932-1935 seriously disrupted national political life. Over 100,000 men were captured, missing or died in the Chaco War and vast amounts of territory were lost to Paraguay. The defeat caused the collapse of the old political structure, the return to military governments, and finally the rise of revolutionary populist and Marxian parties. One such party, the Movimiento Natcionalista Revolucionario (MNR), finally dominated all the others by the mid-1940's, after amalgamating its nationalist middle class support to the radical wing of the labor movement, the mine workers. Following a series of major revolts, the MNR finally seized power in April, 1952. After much fighting in which an estimated 600 persons were killed, MNR civilians, police and miners succeeded in overthrowing the national Army. With the victory, the MNR quickly moved to destroy the power of the old regime. The major tin mines were nationalized, the Army temporarily abolished (with the entire office corps exiled or imprisoned), and workers, miners, civilians and finally Indians were given arms. Though the mine workers and urban middle class elements which made the revolution were not interested in land reform as a major issue, the radical wing of the MNR, plus the Indians themselves, forced the issue. With arms in their hands, the peasants went about destroying work records and other elements of the hated ponqueaje and colonato system. Hacendados were killed or forced to leave, the big houses on the estates were sacked, and the classic peasant revolts ripped through the rural areas. Under this pressure, the new revolutionary government accepted the inevitable and abolished the old regime, granting de facto and eventually de jure rights to land for all the ex-colonos of Bolivia. In one stroke a system of exploitation that went back to the Spanish conquest of the 16th century was destroyed forever. Adding to this total reorganization of the rural economy, the government provided universal suffrage to the Indians for the first time in republican history,

encouraged them to organize, and finally began to deliver social and educational services to the peasant masses for the first time in national history.

An unexpected revolution was also effected in the urban middle class which had initially supported the 1952 Revolution. A fantastic inflation from 1952-1956, the highest in the entire world at that time, virtually wiped out the rentier and propertied urban classes who were dependent upon fixed incomes. Along with the hacendados, the urban middle class also suffered heavily as a result of the Revolution.

While the post-1952 regimes have represented all aspects of the political spectrum, from right wing military regimes to popular labor dominated governments, the basic socio-economic revolution initiated in 1952 has not been changed. Land has been effectively redistributed, the mines and the foreign petroleum industry have been nationalized. Education and welfare have been massively supported and Indians have held real and effective political and even military power for the first time since the Conquest.

But the revolution has only been partial. While the dominant export industry was nationalized and the state accounts for the bulk of economic investment, capitalism itself has been left to thrive. In the rural areas, although communal landowning was sanctified, de facto patterns of private ownership were allowed to develop. Thus the Bolivian National Revolution can be considered a partial socialist revolution, in which private property and to some extent the class structure have been preserved, even as the State has become the largest source of investment and salaried income. Also, as in Mexico, while the law of the land decrees a type of modified socialist agriculture with inalienable communal landowning groupings, the reality has been to introduce private control and actually move Bolivian agriculture from the feudal pre-1952 pattern into a pattern more approximating modern capitalist agriculture. At the same time, rural social structure has changed from the simple two class system of landlord and peasant

to a complex multi-class regime.

Thus while Bolivia is not a Cuba or a China, it definitely has much in common with both. In many ways it can be considered either an arrested socialist revolution, or as a type of modified capitalist revolution in a feudal society--at least as far as the rural economy and social order are concerned. In either case, it clearly experienced a profound and violent social revolution which has effectively changed in a short period its traditional class structure. (Further details are given in Klein 1969 and also Klein 1968, 1971a, 1971b; Carter 1971; Malloy 1970; McEwen 1975; Muratorio 1969; Reyeros 1949; and Thorn 1971).

DATA AND METHODS

To have extensive quantitative and qualitative data on a society which has just had a social revolution of this magnitude is exceedingly uncommon; the data on stratification that we have are by far the best and most extensive available for such societies. Given the violence and the anti-foreign bias of most major social revolutions, there is generally no possibility of obtaining extensive survey data. But because the Bolivian Revolution received massive U.S. aid, it has been uniquely receptive to American researchers (including one of the authors, who has spent several years there and has extensive, diverse and long established contacts). Researchers have been able to study Bolivian society to a degree unusual in underdeveloped societies and unique in those in the midst of violent social revolutions. And of all these studies, without doubt the most complete social survey ever undertaken was a study by the Research Institute for the Study of Man sponsored by the Peace Corps in 1964-66 and kindly made available to us by Vera Rubin and Lambros Comitas. It includes ethnographic field work in six representative rural areas, a census of all inhabitants of the areas, and an extensive social survey of 1,130 heads of households. The social survey includes detailed information, both current and retrospective, on stratification, politics, and related topics; it is our main source of quantitative

data.

The data available in this study allow us to test many but not all of our theoretical predictions. The heart of the theory deals with the effects of a radical revolution on inequality in one generation and the inheritance of status from one generation to the next. 1) We have appropriate retrospective data to measure status inheritance before, around the time of, and after the revolution. The data include detailed information on father's occupation and father's education (the conventional and appropriate measures of family background), and respondent's education and first job (the comparable information for the next generation); these are the classical variables for this type of research (e.g. Blau and Duncan 1966, and virtually all subsequent work in this, now dominant, paradigm). Older cohorts completed their education and started their careers before the revolution, somewhat younger men did so in the revolutionary period, and the youngest cohorts went through the same stages in the life cycle after the revolution, so we can measure status inheritance before, during, and after the revolution and so test our predictions about revolution's effects on it. 2) But we have no such retrospective information on income, standard of living or wealth; retrospective information on such things is notoriously unreliable under the best and simplest of conditions and in a suspicious, peasant society with few written accounts and great fear of tax collectors, it is simply out of the question. So we unfortunately cannot test the predictions about changes in inequality within a single generation. 3) We will also be able to test some of our less central predictions about revolution's effects on education. So in all, while we cannot test all our predictions, those we can test pertain to a key aspect of the theory; testing them also provides an indirect test of the rest of the theory since the logical links between them are close. In addition, status inheritance, under rubrics like "inequality of opportunity", is a matter of considerable practical interest.

The RISM Bolivia Project

. The data are from a large (N=1,130), representative sample survey of male heads of household conducted by Vera Rubin, Lambros Comitas and William J. McEwen for the Research Institute for the Study of Man under a grant from the Peace Corps.[16] After a three month field reconnaissance, six towns were chosen to represent Bolivia's various social and ecological zones and diverse experiences in the 1952 revolution. Two are Aymara Indian villages in the altiplano (a plateau at approximately twelve thousand feet in the heart of the Andes, long the dominant population center), two are mixed Indian and Spanish speaking communities in the Eastern Cordillera Andean valleys (both long established agricultural and market twons in fertile and densely populated areas), one is an isolated Spansih speaking community in the far south depending mainly on irrigated vineyards, and the last is an old Spanish speaking community in the tropical lowlands connected with the outside world only by air. All are small and predominantly agricultural; the two Aymara villages have a population of 1,200 and 1,400 respectively, the mixed communities are 1,800 and 2,100, the southern town has only 600 people and the tropical town 2,100. Our data exclude residents of the large cities (although only ten percent of the population lives in towns over a hundred thousand: Lyle and Calman 1966, p. 15) and the more politicized Quechua of the Cochabamba valley but is otherwise quite representative. While a national sample might have been desirable, it would have been impossible in practice. The actual design has the great advantage of being supported by detailed ethnographic surveys of each town which provide an analytical base of unusual depth. Anthropological field studies, each lasting seven to eleven months, were conducted in each community during 1964-66; each team was headed by a senior anthropologist, with thirty-one professional staff in all. Approximately one hundred thousand paragraphs of field notes classified by topic, a comprehensive ethnography (McEwen 1975), a detailed epidemiological study (Omram, McEwen and Zaki 1967), and numerous specialized papers (listed in McEwen) provide an unusually comprehensive ethnographic

background for our analysis. The questionnaire on which our report is based was designed after the anthropological field work was well underway and benefited from an intimate knowledge of the population. Preparation began in the fall of 1965, the questionnaire was pretested the following May and subsequently revised, with final interviews beginning that summer and extending through September. There were two interviewing teams, one working in Aymara and the other in Spanish. They were recruited primarily from the ethnographic field teams, further trained, and worked together throughout the interviewing, moving from town to town with the supervisory personnel. They obtained 81% of the interviews, the remainder coming from assistants recruited locally and trained by the survey team. Access and rapport proved to be no problem since the project's anthropologists were still in the community or had only recently left, so we are confident that the questions were answered frankly and accurately, something that is not always true of surveys conducted in isolated and suspicious rural communities unused to this type of research. For various personal and financial reasons the survey data have not previously been analyzed, and this is the first report on them.

Sample At the beginning of the fieldwork a complete house-to-house census was taken of each town, and the sample was drawn from it. Only adult male heads of household were sampled. In the three smaller towns all were included. In the three larger towns samples of between one and two hundred were selected randomly from the census list but the sample snowballed outward from them to include people named in sociometric questions (friends, relatives, people with power or influence, etc.). A few additional men identified as influential by the resident anthropologists were also included. The completion rate was a quite satisfactory 83%, ranging from a low of 64% in one Indian village to a high of 95% in the other. Refusals ran about ten percent but the great majority of the losses were people who could not be located at home, primarily farmers who stayed on their land some hours away, returning to their village homes only erratically. The sample is large relative to

the population; in all, over two-thirds of the male heads of household were interviewed.[17] The restriction to heads of household is not serious; 40% of all males between ages 20 and 24 and 86% of males 25 and older are heads of household (Republica de Bolivia 1955, pp. 66-67). The restriction to men is unfortunate.[18]

The sample appears to be representative of the towns from which it was drawn; although illiterates and bilingual Indians are somewhat underrepresented, the regression estimates which are our main concern appear to be virtually unbiased. 1) Compared to household heads in the town census, the sample has 3% fewer illiterates[19] (32% to 35%). It appears to have 7% more monolingual Aymara speakers and 17% more monolingual Spansih speakers with bilinguals correspondingly underrepresented, partly because of the deliberate undersampling of the two large, heavily bilingual towns. The overrepresentation of Spanish speakers is probably a genuine bias but the underrepresentation of bilinguals is probably not-- bilingualism has very high status among the Aymara and it is easy to claim facility in Spanish on the single census question (or have the family member providing the information claim it for you) but impossible to exaggerate it in the course of a two hour personal interview in which true bilinguals would invariably use Spanish. There is no difference in age, which averages 45 (with standard deviation of 16) in the survey and 44 (with the same standard deviation) in the population. The occupational distributions also appear very similar (details are given in Appendix A). 2) More crucially for present purposes, where they can be compared the regression estimates obtained with the sample appear to be, for all practical purposes, essentially the same as those that would be obtained for the whole population. Using the town census, we are able to compare the regressions of education and language on occupation separately for the entire census population and for those also in the survey. The comparison, presented in Appendix A, suggests that there is no appreciable bias.

It is more difficult to say whether the sample is representative of rural Bolivia as a whole but in our judgment it is probably representative of the Aymara,

bilingual and Spanish speaking populations, the main weakness being the omission of the Cochabamba valley with its large Quechua Indian community. The only nationwide data yet available are from the 1950 census and they do not allow an urban-rural distinction. Nonetheless the age distribution in the sample is virtually identical to the national figures and the proportion Indian is very close (57% in the sample, 61% nationwide; Republica de Bolivia 1955, pp. 55, 100).* Illiteracy is more problematic since it has been rapidly declining. We estimate that it is approximately 47% in the nation, 15% higher than in the sample.[20] For those who have attended school, the educational distributions are very close-- 78% primary only, 16% secondary and 6% university for the sample compared to 81%, 14%, and 6% in the population. To make the sample more representative we have weighted it to match the proportion Indian and the age-specific illiteracy rates for the nation. This adjustment made no real difference to the correlations or regressions[21] but makes the significance tests approximate.[22]

Measurement

Occupational status In Bolivia, as throughout the world, a man's occupation is the crucial determinant of his status in the world, largely determining how he lives and how he is regarded by others. We have detailed information on both respondent's occupation and his father's occupation when the respondent was growing up. The information includes land ownership and number of paid employees (which are crucial to distinguishing wealth and status among farmers), number of family employees, and whether or not self-employed. It was coded into an expansion of the International Labor Office's (1968) four digit classification with, among others, additional distinctions among farmers.

While recalling some kinds of information from the past may not be very accurate, this is not usually a problem with recalling occupation, since that is a clear, salient, and relatively simple matter (e.g. Blau and Duncan 1967). This is especially true in Bolivia where the occupational structure is relatively simple, most people

stay in the same job throughout their lives, and much work is done in and around the home so that even the father's occupation is often a routine aspect of a child's life. Respondents showed no hesitation or apparent difficulty in recalling their own first job, or their father's occupation, or in giving quite detailed information about them.

Coding occupation status is difficult, with different procedures often giving different results which easily can, and have, led to inaccurate substantive conclusions (Treiman 1975, especially Table 3). For our purposes the problem is eased since we are not especially concerned with the absolute size of coefficients but with the changes in them over time; any bias that affects people in all periods equally will therefore have no effect on our conclusions. But the problem is still substantial and we therefore scored occupations by four different procedures, on the argument that if several different but seemingly reasonable procedures give essentially interchangeable results, much more confidence can be placed in the conclusions. We also applied our procedures to data from another country, the United States, to ensure that our procedures were not capitalizing on some unique and possibly misleading feature of the Bolivian stratification system. 1) We divided occupations into a modification of Treiman's (1977) fifteen category scheme based on the International Labor Office's major groups with additional subdivisions by prestige. The categories are high prestige professional, technical and kindred; low prestige professional, etc; administrative and managerial; high prestige clerical; low clerical; high prestige sales, low sales; high production; medium production; low prestige production; high service; low service; high agricultural; medium agricultural; and low prestige agricultural.. We then assigned scores to these categories by Klatzky and Hodge's (1971) canonical procedure which maximizes the correlation between father's and son's occupation without prior assumptions about the ranking of the categories. If the relation between father's and son's occupation is approximately linear when occupations

are measured by their true status and if the categories are reasonably homogeneous, this procedure will locate the true ordering (further description, justification and cautions are given in Klatzky and Hodge 1971). This gives one set of scores for father's occupation and another for son's (which allows for generational changes). Scores are identified only up to a linear transformation and we adopt the conventional metric, scoring the lowest category zero and the highest one hundred. 2) We classified occupations according to ethnographically appropriate schemes and scored them by Klatzky and Hodge's procedure. In Bolivia we developed a thirteen category scheme based on theory and ethnographic knowledge, distinguishing large farmer, cattle rancher, specialized farmer, specialized farm worker, small farmer or farm worker, elite white collar, high white collar, small business, clerical and sales, skilled modern blue collar, skilled traditional blue collar, and unskilled non-farm. For the U.S. we used Blau and Duncan's expansion of the census major group codes obtaining scores virtually identical to Klatzky and Hodge's (1971, p. 19). 3) We used a more traditional ethnographic measure of occupational status. For Bolivia we scored each category of the ethnographic classification described above according to the average standard of living.[24] For the U.S. we used the standard Duncan SEI index (Reiss 1961, pp. 109-138), essentially an average of income and education for each detailed census occupation. 4) We score occupations by Treiman's (1975, 1977) standard international prestige scores, which are known to be essentially invariant throughout the world.

Procedures one, two and three produce equivalent results; details are given in Appendix B. The correlation between the five scores (two each from methods one and two and one from method three) averages .95 in Bolivia and .89 in the U.S., calculated over individuals. The crucial correlation between father's and son's occupation is essentially the same with each; in Bolivia estimates range from .61 to .63 and in the U.S. from .40 to .43. The correlations between occupation on

the one hand and education, income, and father's education are also virtually identical. Procedure four, however, gives results which are not highly correlated with the others, nor with education and income, and are therefore suspect; here as elsewhere (Featherman and Hauser 1976) this procedure apparently gives results which are heavily tainted by measurement error. We adopt the scores from procedure three, the traditional ethnographic scoring, in order to do full justice to local conditions. Using the scores from procedure one or two leads to exactly the same substantive conclusions.

Education We measured education in years of schooling. This implicity assumes that a year at any level provides the same benefits in occupational status. An effect proportional weighting scheme which does not make this assumption (Treiman and Terrell 1975) gives equivalent results; it is correlated .98 with years of schooling in Bolivia (and .95 in the U.S.) and has virtually identical correlations with other variables. We therefore report the conventional and more easily interpreted years of schooling.

Spanish vs Aymara We include the parents' language in the analysis as an additional control variable, since it is reputedly (although not in fact) an important aspect of family background in Bolivia. We counted anyone whose parents were essentially monolingual Spanish speakers as coming from Spanish background and those from monolingual Aymara families as of Aymara family background. A tiny handful of people whose parents spoke other European languages were counted as Spanish and a few whose parents spoke other Indian languages were counted with the Aymara. Only 3% of the sample came from families with mixed or unknown linguistic patterns; they are treated as missing data.

Methods of analysis

Cohorts Ours is a cohort analysis (e.g. Ryder 1965), the essential assumptions being that the older cohort completed their education and started their career before the revolution, that the middle cohort completed theirs just after the revolution, that the most recent cohort went through the same stage of the life cycle well after

the revolution, and that differences in the pattern of status attainment in these cohorts can reasonably be attributed to the changes introduced by the revolution. A major difficulty here, at least in theory, is disentangling the effects of the revolution from the effects of other processes that were occurring at the same time-- distinguishing, that is, the revolution's effects from those of the rest of the on-going stream of history. In practice, this is not too difficult since we are dealing with what is historically a short time span and for rural Bolivia, the revolution is the only major social change in this period. There was, in particular, no industrialization and, unlike many third world societies in Africa and Asia, no colonial or nationalist forces undermining traditional rural authority patterns before the revolution. The revolution came about because of events in the capitals and tin mining areas, areas quite apart from the then traditional rural sector. The changes in rural areas came about afterwards and are consequences of the revolution, not causes and not independent processes.

Defining the exact boundary between one cohort and the next is, of course, necessarily somewhat arbitrary but in Bolivia the main boundaries are reasonably clear. In any event, minor adjustments one way or the other in the definitions make no real difference to the results. 1) The age at which rural Bolivians end their education varies a good deal-- many start relatively late and many interrupt their schooling only to return after some years; the subsequent transitions from schooling to work and eventually marriage are also somewhat various. Nonetheless, one can reasonably estimate that the great majority pass through these stages in their late teens or early to mid twenties. We have therefore defined men who were twenty-eight or older at the time of the revolution as having come of age earlier, in pre-revolutionary times; they were 40 or older at the time of the survey. 2) The boundary between those who came of age in the period shortly following the revolution, to whom the predictions about short term effects (Hypotheses 1-3) apply, and those who came of age rather later, to whom the predictions about long term effects (Hypotheses 4-8) apply, is

less clear since neither theory nor history offers a clear boundary point. But in practice the political changes, the establishment of mass parties and pressure groups, the legal and administrative processes involved in transferring land to the peasants, the formation of 'syndicates' and similar co-operative and union style organizations, the exploration of new occupational and economic options by the peasantry, and similar major adjustments took many years, particularly in the rural area with which we are concerned. Things were still unsettled and in the midst of change six or seven years after the revolution but had clearly settled down ten or twelve years later; we have therefore picked the nine years following the revolution as the revolutionary period. An empirical analysis of successive one year age cohorts confirms that the stratification patterns change noticeably eight to ten years after the revolution. These men were between nineteen and twenty-seven at the time of the revolution and thirty to thirty-nine at the time of the survey. 3) The remaining group came of age in the post-revolutionary period. We have confined the analysis to those twenty-four or older at the time of the survey, which would make them twelve to eighteen at the time of the revolution. The reason for not including younger people is to avoid a bias well known in stratification research. The people who get married at a very early age, and so appear in a head of household sample like ours, are disproportionately those who have little schooling and so finished early and embarked on their occupational and marital careers at an early age; their limited education (and possibly the disadvantage of marrying early) condemns them to poor jobs. More successful people of the same age are still in school or have recently taken up jobs but not yet married, so they do not appear in the sample. A sample of very young people is thus biased in a way that leads to a considerable understatement of the advantages of education and family background. We therefore restricted the sample to an age group old enough that the great majority have already married and established households, a conventional procedure. This restriction is in practice of little consequence and the substantive conclusions remain the same when younger

people are included. In all, there are 628 men in the pre-revolutionary period, 271 in the revolutionary period, and 169 in the post-revolutionary period.

Regression Analysis We rely primarily on regression analysis (of which path analysis is a special case) and on related techniques. These are now standard--and very fruitful-- methods in modern work on stratification (e.g. Blau and Duncan 1967; Duncan, Featherman and Duncan 1972). Many of our hypotheses make predictions about unstandardized partial regression coefficients (e.g. that father's occupational status has a stronger effect on son's status for cohorts who came of age well after the revolution). The virtues of regression analysis are by now well known (e.g. Duncan 1966), and it has been used with particular success in studies of stratification in a variety of societies, developed and underdeveloped (e.g. Blau and Duncan 1967; Kelley 1977; Kelley and Perlman 1971; Treiman and Terrell 1975). It does, however, require certain assumptions (e.g. Johnston 1963, Ch. 4), notably that the true relations are to a reasonable approximation linear and additive.[25] But a large body of substantive experience, particularly in the area of stratification, now suggests that these assumptions are not implausible (e.g. Jackson and Curtis 1972) and, in any event, regression analysis is famously robust so that violating the assumptions often has only substantively trivial consequences (Bohrnstedt and Carter 1971; Goldberger 1968). This seems clearly to be the case for stratification variables in the U.S. (Blau and Duncan 1967, Ch. 4 and Appendix H). Furthermore we looked for departures from linearity and additivity in our tabular analysis and by other means and have found none of any consequence.

We also use an extension of regression analysis, analysis of covariance, a powerful way of testing our hypothesis that the pattern of relationships is different in different cohorts. Adding a dummy variable for cohort and appropriate interaction terms to an ordinary regression equation gives an analysis of covariance in convenient form (Goldberger 1968, Ch. 8).

REVOLUTION AND STATUS INHERITANCE IN BOLIVIA

Our theory makes two key predictions, first that in the short run a radical revolution causes inequality and status inheritance to decrease and, second, that in the long run a radical revolution causes inequality and status inheritance to increase again and in some circumstances to surpass pre-revolutionary levels. We will be able to test both predictions about status inheritance, although not those about inequality since we have no retrospective data on inequality of income or wealth. It is worth noting that our predictions were made long before we looked at the data. The theory was formulated in our original grant proposal (Kelley and Klein 1974), at which point we had done no analysis. The data were not running on the computer for another six months and the first analysis of this topic was almost a year and a half later.

The key results are given in Table 1, based on data from Appendix C. We deal first with revolution's short term effects and then with the long term effects.

Short term effects

In the short run the revolution led to a decrease in the inheritance of status from one generation to the next, as predicted by Hypothesis 1. Beginning with the simplest results, the correlation measure between father's and son's occupational status, the usual measure of status inheritance (see Footnote 3), dropped from .53 in pre-revolutionary times to .44 for the cohort who came of age shortly after the revolution; put in another way, father's occupational status alone explained 28% of the variance in son's occupational status in pre-revolutionary times but only 19% in revolutionary times. The difference in the impact of father's occupational status is statistically significant when tested by conventional analysis of covariance procedures ($t=1.90$, $p<.05$, one tailed), even though we have used very conservative assumptions.[26] Furthermore a more comprehensive measure of family background--father's education and parents' language in addition to father's occupation-- all together explain 31% of the variance before the revolution but only 24% in the revolutionary period (Table 1, line 5). The most appropriate comparison is with the

unstandardized partial regression coefficients, which express the influence of father's occupation (net of father's education and language) in a way that allows for a direct comparison between periods. This falls from .31 in pre-revolutionary times to .17 for the revolutionary period (line 6, columns 1 and 2). This means that the direct and indirect advantages of having a father at the top of the occupational hierarchy are enough to get a son almost a third of the way up himself in pre-revolutionary times but only enough to get him a sixth of the way up in revolutionary times, a decline of almost one half in this component of status inheritance. The standardized partial regression coefficients tell the same story in a different metric.[27] In pre-revolutionary times, father's occupational status is clearly the largest single influence on son's first job (lines 1 to 3 in column 1); a one standard deviation increase in father's status increases son's status by a third of a standard deviation while a one standard deviation increase in father's education increases son's status only by a fifth and a comparable improvement in linguistic background would increase it by only a tenth of a standard deviation. In the revolutionary period father's occupation is much less important, while father's education is the main influence and linguistic background is still unimportant.

(Table 1 about here)

There are two advantages of having a father with high occupational status. One is indirect in that their sons are likely to get more education for various reasons and the education will, in turn, improve the son's occupational chances; in our model this shows up as an indirect effect via education. But insofar as fathers give their sons land, or bring them into family businesses, or pass on other forms of physical capital, or use their contacts and influence to secure them good jobs, or the like, these appear in this analysis as direct effects of father's occupation, controlling for education.[28] But property and influence are, we argued, precisely the sort of resources that are most vulnerable to disruption in a revolution and that disruption is the main cause of the predicted decline in status inheritance. So a more sensitive test of our theory lies in revolution's predicted consequences

Table 1 Revolution and status inheritance in Bolivia: Effects of family background on the status of son's first occupation (columns 1-6) or education (columns 7-9) for pre-revolutionary (PreR), revolutionary (Revol), and post-revolutionary (PostR) cohorts separately. Standardized and unstandardized partial regression coefficients based on data in Appendix C.

	Son's Occupation[2]			Son's Occupation[2]			Son's Education[3]		
Independent Variables	PreR (1)	Revol (2)	PostR (3)	PreR (4)	Revol (5)	PostR (6)	PreR (7)	Revol (8)	PostR (9)
Standardized Partial Regression Coefficients (betas)									
1. Father's Occupational Status...	.33	.19	.47	.25	.11*	.41	.24	.17	.26
2. Father's Education.....	.20	.28	.24	.03*	.03*	.09*	.49	.57	.56
3. Parents' Language.....	.09	.09*	-.11*	.06*	.08*	-.11*	.08	.02*	-.01*
4. Son's Education.....	--	--	--	.35	.43	.26	--	--	--
5. (% of Variance Explained, R^2)..	(31)	(24)	(36)	(37)	(27)	(39)	(54)	(51)	(55)
Unstandardized Partial Regression Coefficients (b's)									
6. Father's Occupational Status (Top=100, bottom=0).....	.31	.17	.42	.23	.10*	.36	.035	.025	.035
7. Father's Education (years)....	1.3	1.8	1.9	0.2*	0.2*	0.7*	.48	.58	.71
8. Parents' Language (Spanish=1, Aymara=0).....	5	4*	-5*	3*	4*	-5*	0.6	0.2*	-0.1*
9. Son's Education (years).....	--	--	--	2.3	2.7	1.7	--	--	--

* Not significantly different from zero at $p < .05$, two tailed.

1. The number of cases for the pre-revolutionary, revolutionary and post-revolutionary periods respectively is 628, 271, and 169.
2. Scored in the same way as father's occupation with a top of 100 and a bottom of 0.
3. In years.

for this direct effect; the prediction is, of course, that revolution makes it smaller. In fact, the prediction is clearly confirmed, the unstandardized partial regression coefficient falling from .23 in pre-revolutionary times to .10 for the revolutionary cohort (line 6, columns 4 and 5). This means that the advantage of having a father at the top of the occupational hierarchy is, quite apart from its indirect advantages via education, in and of itself enough to get a son almost a quarter of the way up the hierarchy himself in pre-revolutionary times while in revolutionary times it is only enough to get him a tenth of the way up, a decline of over one half in this component of status inheritance. This decline is statistically significant ($t=1.76$, $p<.05$, one tailed) and, furthermore, the direct effect of father's occupation in the revolutionary period is not even significantly different from zero ($t=1.39$, $p>.10$, two tailed).

The revolution seems to have changed the way in which high status fathers are able to pass advantages on to their sons, greatly weakening the role of physical capital and the like but leaving that of human capital almost untouched, as we predicted. The indirect advantage that sons from families of high occupational status get by virtue of themselves getting more education, and hence getting better jobs, is little affected by revolution. Family background continues to have a strong effect on education in revolutionary times, explaining 54% of the variance before the revolution and 51% in the revolutionary period; the estimated impact of father's occupation is slightly lower in the revolutionary period, and that of father's education slightly greater, but neither of these differences is large nor do they approach statistical significance ($p>.10$), so it seems that the revolution had little if any effect on the educational advantages of coming from a high status family (see columns 7 and 8). Furthermore, education continues to have a strong impact on occupational status after the revolution (a matter to which we return), so the educational advantage is subsequently translated into an occupational advantage. That indirect effect of father's occupation through son's education comes to .08

before the revolution (compared to the direct effect of .23, both expressed in unstandardized terms from line 6) and drops only to .07 afterwards (compared to direct effect of .10). So the indirect advantage accounted for 24% of the advantage of coming from a high status family before the revolution but fully 42% of the (smaller) advantage afterwards.

As we predicted, revolution does not appear to reduce the advantage of coming from a well educated family but in Bolivia has, if anything, actually increased it. The advantage appears to have increased by about 40%, each year of father's education providing his son with an estimated 1.3 points of occupational status in the pre-revolutionary period and increasing to 1.8 points in revolutionary times (line 7, columns 1 and 2; the standardized coefficients on line 2 increase similarly). So having a father who completed the twelve years of secondary schooling rather than an illiterate father is enough to get a son a sixth of the way up the occupational hierarchy in pre-revolutionary times but only somewhat more than a fifth of the way up during the revolution. This increase is not statistically significant with a sample of this size ($t=.90$, $p>.10$) but it is clearly not a decline. The reason that father's education continues to be an advantage is that its effects in Bolivia as in all other societies studied to date (e.g. Blau and Duncan 1967; Treiman and Terrell 1975) come about entirely because the father is able to get his son further along in school and that in turn provides a better job;[29] we have seen that high status families continued to provide their sons with educational advantages during the revolution and will see that education continues to confer a great advantage, so this indirect path is unaffected by revolution.

In all, it seems reasonably clear that the Bolivian revolution led in the short run to a decline in status inheritance, as we predicted. Although this is rather less certain, it seems likely that the revolution disrupted the transmission of status via physical capital and other resources closely linked to the father's occupational position, reducing their effectiveness by about one half, but had

little or no effect on the transmission of advantages via human capital; this is also as we predicted.

Long term effects

We have predicted that a radical revolution eventually leads to an increase in status inheritance, i.e. that there is more status inheritance in the post-revolutionary period than there was in revolutionary times. In rural Bolivia, the 1952 revolution was a revolution of the vast bulk of the population against a tiny dominant and exploitative elite; the revolution, as we have seen, began among the middle and professional classes and the tin miners and only later spread with their assistance to the rural lower classes, so it was by no means a revolt of the bottom against the middle, or countryside against town. The old elite either fled to the capital or were killed and so handly any remain in our sample of rural and small town Bolivia. Consequently we will be able to test the predictions about revolution's effects on the previously exploited majority of the rural population (Hypothesis 7) but, lacking data on the capital, we cannot test the predictions about Bolivia as a whole (Hypothesis 8). The results, given in Table 1, clearly support the prediction.

In the long run, the forces set loose by the revolution lead to an increase in the inheritance of status from one generation to the next. To begin with the simplest figure, the correlation between father's and son's occupational status, which is the usual measure of status inheritance, increased from .44 in the revolutionary period to .57 in the post-revolutionary period; that is to say that father's occupational status explained 19% of the variance in son's status in the revolutionary period but 33% in the later period. This increase is statistically significant ($t=1.35$, $p<.10$) in spite of the less than enormous sample in these periods and the conservative assumptions about it.[30] All family background variables together explained 24% of the variance in son's occupation in the revolutionary period but that rose to 36% in post-revolutionary times (Table 1, line 5). The most appropriate comparison is again the unstandardized partial regression coefficient measuring the

impact of father's occupation. This more than doubled in the post-revolutionary period, going from .17 to .42 (line 6, columns 2 and 3). So in the revolutionary period having a father at the top of the occupational hierarchy rather than the bottom provided sufficient direct and indirect advantages to bring a son up only a sixth of the way but, less than ten years afterwards, the advantage had grown and was enough to get him fully two fifths of the way up. Furthermore, the standardized coefficients show that father's education was the main influence in the revolutionary period, half again as important as father's occupation, while by the post-revolutionary period, father's occupation was almost twice as important as his education (lines 1 and 2, columns 2 and 3). If anything, having a high status father confers a greater advantage in post-revolutionary Bolivia than it did even in pre-revolutionary times.

The advantage of having a high status father can again be decomposed into direct and indirect effects through education. As we argued earlier, the direct effects presumably reflect the role of land, family businesses, other forms of physical capital, influence, and such, in transmitting advantages from one generation to the next and it is those which should in theory be most affected by the post-revolutionary developments and so provide the most sensitive test of our prediction. In fact the prediction is clearly confirmed; the direct effect is substantially and significantly larger in post-revolutionary Bolivia ($t=1.71$, $p<.05$), more than tripling from .10 in the revolutionary period to .36 afterwards (line 6). This means that having a father at the top of the occupational hierarchy was in and of itself, apart from the indirect advantages via education, worth only enough to get a son a tenth of the way up the hierarchy in revolutionary times but had grown in post-revolutionary times, becoming enough to get him more than a third of the way to the top of the heap. In post-revolutionary Bolivia, as in pre-revolutionary times, the advantage of coming from a high status family was predominantly a direct advantage rather than indirect through education; the indirect advantage had declined to 14% of the total, compared to 42% in the revolutionary period and 24% in pre-revolutionary

times. Post-revolutionary Bolivia is apparently characterized by a great deal of status inheritance-- as much or more than in pre-revolutionary times-- most of it seeming to depend on property, influence and the like.

The advantage of coming from a well educated family remains as large in post-revolutionary Bolivia as it was during the revolution or before, as we predicted. Each year of father's education is worth 1.9 occupational status points in post-revolutionary Bolivia, so having a father who finished secondary school rather than an illiterate father is enough to get a son just over a fifth of the way up the occupational hierarchy himself (line 7, column 3). This is essentially the same as in the revolutionary period (1.8 status points) and only a little higher than the 1.3 points in pre-revolutionary times; none of these differences are statistically significant, although it is of course apparent that the father's educational background has not declined in importance.

In all, it seems clear that the Bolivian National Revolution of 1952 led to a decrease in status inheritance in the short run but that, in the long run, status inheritance re-emerged, reaching and perhaps exceeding its pre-revolutionary levels. Father's occupation became almost two and a half times as important as it had been in revolutionary times; this seems to reflect the re-emergence of land, businesses, capital, and contacts as means of passing status on from one generation to the next, although that is far from certain. Coming from a well educated family is as advantageous, if not more advantageous, as in the past.

REPLICATION: STATUS INHERITANCE AFTER POLAND'S COMMUNIST REVOLUTION

To the best of our knowledge, the only other reliable data on revolution and status inheritance are from a Polish study by Zagorski (1971). He presents data on a random sample of 3,260 men and women divided into four age cohorts: before World War II, during the war, the beginning of the revolutionary Communist period (1945-1955), and a post-revolutionary period (1956-1968). The published data include only father's occupation status and respondent's occupation, dichotomized into

manual and non-manual;[31] while this is a very crude way of coding occupations, it is a well known procedure which should, on experience in other countries, be at least in the right general ballpark. The results reported below are computed from his tables.

The correlation between father's and son's occupational status in Poland is shown in Figure 1 and the Bolivian data are shown there in the same metric. The (Figure 1 about here)
Polish data agree perfectly with our theoretical predictions and the correspondence between them and the Bolivian results is striking. That two countries as diverse as rural Bolivia and Communist Poland show this pattern is strong evidence for our theory.

OTHER EFFECTS OF THE BOLIVIAN REVOLUTION: EDUCATION

We can test a few of our predictions concerning education with the data at hand, although the predictions are not as central to the theory as those on status inheritance and are subject to more methodological doubts.

Hypothesis 2 predicts, among other things, that revolution causes a shift in the basis of stratification, making education more important relative to physical capital and other resources. There is appreciable evidence for this. We have already seen some evidence in that education's indirect role in transmitting occupational advantages from one generation to the next was little affected by the revolution, while other more direct means of transmitting that advantage became much less effective; consequently education counted for a larger part of the advantage, such as it was, of being born into a high status family (42% rather than 24%). We also saw that father's occupation was (in standardized terms) the most important aspect of family background in pre-revolutionary Bolivia but that father's education became more important in revolutionary times. Respondent's education seems to show a similar growth in importance; in pre-revolutionary Bolivia it is about half again as important as father's occupation but by the revolution it is roughly four times as important (Table 1, lines 1 and 4, columns 4 and 5). In fact, respondent's own education

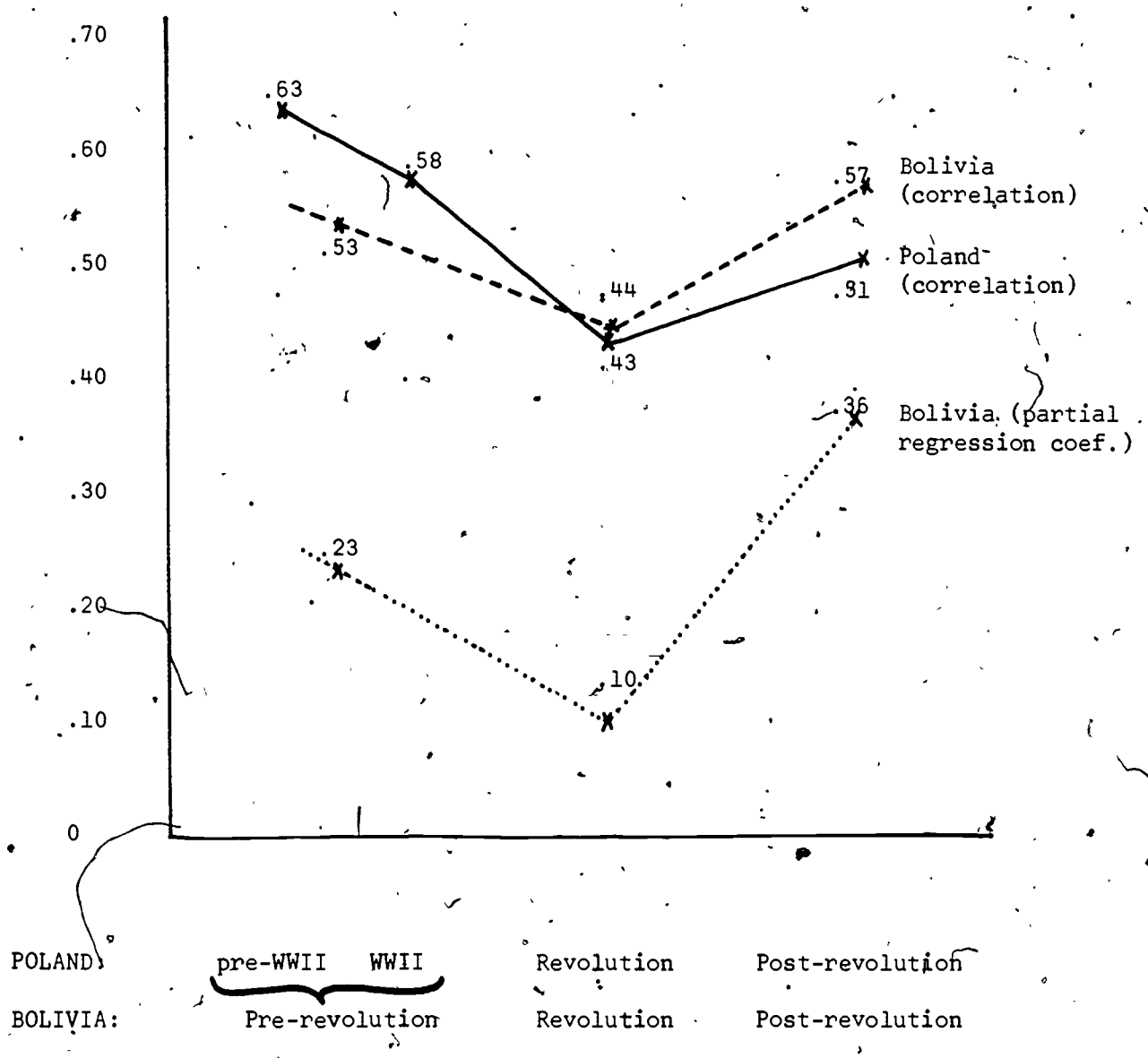

Figure 1 Status inheritance: Correlation between father's and son's occupational status in Poland and Bolivia at different time periods. Also standardized partial regression coefficient giving the direct effect of father's status (net of education and linguistic background) for Bolivia. See text for details.

may have a greater absolute payoff during the revolution, not just a greater payoff relative to the declining fortunes of physical capital but a greater payoff in absolute terms. The increase (2.3 status points to 2.7 points, shown in line 9) is, however, modest and not statistically significant ($t=.41$, $p>.10$). One way of putting it is that the advantage that someone with a secondary education would have over someone with no school was worth five occupational status points more in the revolutionary period than earlier. So in all the data seem to offer reasonable but not dramatic support for our predictions about human capital playing a greater role in stratification during revolutionary times.

Although Hypothesis 3 deals mainly with physical capital and economic benefits, it also predicts that revolutions do not benefit their less educated supporters as much as those with more education-- revolutions do not turn the stratification order upside down but simply move everyone one step up. Insofar as almost everyone in our sample objectively benefited from the revolution, or were at least from a social class which was previously exploited by the old elite, the prediction is clearly confirmed by the data we have already seen; even in the midst of revolution, people with more education will on the average get much better jobs than people without education ($t=5.63$, $p<.01$, see line 9, column 5). Other analyses (not shown) of people who claimed to have supported the revolution at the time give equally clear results.

Finally, Hypothesis 6 predicts that in the long run revolution leads to increasing educational inequality. This is true but the difference is very slight. The standard deviation of education (our usual measure of inequality for reasons analogous to those given in Footnote 2) increases from 3.47 years in the revolutionary period to 3.69 years in post-revolutionary Bolivia, an increase of six percent.

On the whole then, the evidence generally supports our predictions about the effect revolution has on education, but the support is mostly less than dramatic. Education seems to become more important during a revolution, at least relative to physical capital and other more easily disrupted resources. In any event, it is

clear that education remains an advantage even in the midst of revolution; revolutions do not overturn the stratification order nor do the ignorant inherit the revolutionary earth.

4. DISCUSSION

Revolution: The Bolivian Experience

The Bolivian National Revolution of 1952 produced a profound, sudden and violent change in rural Bolivia, an area which had been subject to a brutal, exploitative, essentially feudal despotism since the Spanish conquest three centuries ago. The bulk of the rural population were virtually serfs; they gained access to land only through the payment of three or four days of week of free labor to the land owning hacendados and in addition had regularly to work as unpaid servants or perform other personal services for the hacendado and his family. The hacendados extracted the bulk of the economic surplus, controlled the government, the police, the courts, and the army and used them to ruthlessly suppress any unrest by force of arms. In a matter of months, revolution swept from its urban cradle into the rural areas, burning the work records, sacking the hacendados homes, and killing the hacendados or driving them off the land and into refuge in the capital or abroad. At one stroke, a cruel and ancient system of exploitation was destroyed forever. What were the effects of this change for the mass of ordinary people in the countryside?

It is clear from contemporary evidence that the standard of living rose; the mass of the rural population was clearly better off than before. But beyond that, what is surprising is that so little changed. Revolution did not overturn the stratification system but only lopped off the very top; everyone moved up but those who had advantages before the revolution usually maintained their advantages afterward, especially when their advantages were incorporated into human rather than physical capital. If anything, the advantage of being educated yourself, or coming from an educated family, was increased by revolution and its aftermath.

In the short run status inheritance declined. The revolution apparently reduced by about one half the advantages that could be passed on via land, capital, and other resources closely linked to a father's occupational position. But it had little or no effect on the transmission of advantages through human capital and so a great deal of status inheritance remained in the midst of the fires of revolution. The correlation between father's and son's status dropped, to be sure, but only from .5 to .4. The Polish stratification system proved equally resistant to revolutionary change. The correlation was .6 before the war and barely changed when Poland was conquered and partitioned between two predatory neighbors (dropping only .05); only a thorough Communist revolution imposed by foreign conquest made any impression and then the correlation dropped only to .4. So the available evidence strongly suggests that stratification systems are remarkably robust, revolutions to the contrary notwithstanding.

In the not so long run, status inheritance re-emerges with a vengeance. Within a decade or two of Bolivia's revolution, the correlation between father's and son's status had grown from a revolutionary low of .4 almost to .6, at least as high, if not higher, than the pre-revolutionary level. And the direct advantage of having a father with high occupational status, apart from the indirect advantages via education, grew to be almost two and a half times as large as it was during the height of the revolution and reached or exceeded its pre-revolutionary level. In Poland too, status inheritance was growing again, under a Communist regime and just a decade after the revolution, increasing from .4 to .5. Inequality is reborn with surprising speed.

Implications

These results strongly support our theory. We argued that radical revolutions can be expected to redistribute income and physical capital, making for a more equal distribution of wealth and income in the short run. We also argued that wealth and income provide one of the mechanisms for passing advantages on from one generation

to the next and showed that a more equal distribution of those resources implies less status inheritance. Hence a revolution will, we predicted, lead to a decline in status inheritance and, in fact, it did. But advantages are also, and perhaps predominantly, passed on through education and other forms of human capital and we argued that these were relatively impervious to revolutionary disruption; hence we predicted that status inheritance would not by any means disappear after the revolution, nor does it in fact. In the long run we predicted that inequality would re-emerge after the revolution because revolutionary liberation allows previously exploited groups to make fuller use of their human capital, physical capital, and other resources; that, we showed, can be expected to produce greater inequality and, because of that, also produce more status inheritance. These predictions are clearly confirmed and so offer substantial support for our theory and some warrant for believing that our predictions would be borne out in other revolutionary times and places.

So it seems that a violent social revolution which frees peasants from their traditional exploitation will in the short run improve their standard of living, reduce inequality in the society as a whole and reduce inherited privilege. At this stage the peasants and the radical revolutionary intelligentsia have the same goal, the overthrow of the traditional elite and the end of exploitation, but that does not last. Peasants with more land, human capital, or other resources are able to exploit their advantages more fully after the revolution. And revolution inadvertently sets loose forces which, if unchecked, will in the long run allow inequality and inherited privilege to grow steadily, and, in some circumstances, to exceed their pre-revolutionary values. The result will be a relatively rigid rural stratification system of a familiar capitalist type with rich peasants playing the role of capitalist entrepreneur. Thwarting these forces is never easy and often impossible. Liberal policies, or even moderate socialist policies which allow a mixed economy, will hardly repress these deeply rooted forces. They involve the property of modest

family farmers and the opportunities for small traders, small businessmen, government bureaucrats, and the holders of human capital who will accumulate wealth and pass it on to their children unless all private property is nationalized. By giving in to these forces, accepting the new status quo and abandoning any further redistribution in the countryside, a revolution can maintain the allegiance of the new elites, leaving a peaceful, prosperous and highly stratified countryside. The Bolivian and Mexican revolutions, for example, seem to have taken this conservative course. The only viable alternative is a radical attempt to root out even the smallest vestiges of private property, as in China or Cuba. Among other things, this requires extensive economic planning, a large and effective bureaucracy with unusual commitment and incorruptibility, the power to overcome strong opposition in the countryside, and the willingness to bear the substantial human costs involved. But even that does not solve the whole problem. If differences in education, skills, language, ability or other kinds of human capital remain they will eventually (albeit more slowly) lead to inequality and, unless children are raised apart from their parents, to inherited advantage. That is much harder to control. Confiscating land and machines is easy compared to controlling human capital and even in simple societies it is at least as important to the economy; to date, only China has been willing to bear the costs of a determined assault on it and even there the outcome is far from clear. In short, a revolution must either quietly turn conservative, allowing inequality and inherited privilege to grow steadily in the countryside, or turn radical and embark with uncertain prospects on an arduous struggle to remake the entire economy and culture.

APPENDIX A: REPRESENTATIVENESS OF THE RISM SAMPLE

This appendix shows that the RISM survey data are representative of the population of the six towns from which they were drawn. The evidence comes from a comparison of all heads of household in the anthropological census of the towns with those who were also interviewed in the survey. We were able to identify 606 heads of household who were interviewed in both the census and the survey; the remaining 524 heads in the survey could not be identified due to omissions in the census, modest differences in geographic coverage, problems with identification numbers in the vineyard town, and various errors and omissions in the surviving census records. We compare results for the interviewed heads with results for the target population, the 1217 male heads of households, 20 or older, in the full census (excluding the vineyard town). We weighted the interviewed heads by a procedure like that used to weight the survey, matching the target population's distribution by town and literacy. This adjusts for differential sample weights and makes the analysis comparable to the results reported in text.

The census data are much less reliable than the survey data and are not directly comparable with them. 1) Language is coded monolingual Aymara, bilingual and Spanish, with considerable bias for reasons indicated in text. These were scored 1, 2 and 3 since bilinguals are in practice Aymara speakers who have Spanish as a second language. 2) Education is in years. 3) Occupation was recorded only briefly and coded into an ad hoc system which, among other problems, did not preserve the crucial distinction between large, medium and small farmers. Also, the census takers not infrequently confused secondary with primary occupations, particularly for peasants. For the present analysis we recoded occupations into an appropriately modified version of the procedure two scores described earlier; this gives scores from 0 to 100.

There is no real difference between those interviewed in the survey and the target population. Table A gives the data. The means and standard deviations for

language, education, and occupational status are virtually identical. The regressions on occupation are also essentially the same. Each year of education is worth two and one half status points in the survey sample compared to two and three quarters in the full census and the standardized coefficients are identical. Language has no net effect in either. The percent of variance explained is barely one percent higher in the census; if that tiny difference is real and extends to other variables, it implies that the key results reported in text are if anything conservative, slightly understating the differences between Bolivia and the United States.

Table A. Correlations, means, standard deviations and regressions on occupational status separately for male heads of household, 20 or older (i) in the anthropological census and (ii) both in the census and also in the RISM sample survey.

	(i) Census			(ii) RISM sample		
	Lang. (1)	Educ. (2)	Occ. (3)	Lang. (1)	Educ. (2)	Occ. (3)
Correlations						
(1) Language		.44	.15		.41	.10
(2) Education	.44		.32	.41		.30
(3) Occupation	.15	.32		.10	.30	
Means	2.0	3.1	51	2.0	3.2	54
Standard Deviations	0.7	3.4	30	0.7	3.4	28
Regression statistics						
b's on occupation	.63*	2.75	---	-.99*	2.52	---
β's on occupation	.01*	.31	---	-.02*	.31	---
R^2 on occupation			10%			9%

* Not significant at $p<.05$

APPENDIX B. Correlations, means and standard deviations for various versions of occupational status for Bolivia (above diagonal) and the United States (below diagonal) separately. See text for definitions; decimals omitted.

Variables & scoring procedures	Father's occupation						Son's occupation						F's Ed	S's Ed	With or $
	1-F	1-S	2-F	2-S	Eth	Pst	1-F	1-S	2-F	2-S	Eth	Pst			
Father's occupation															
Procedure 1, scores from Father		98	98	91	90	59	61	62	63	63	62	29	62	58	49
Procedure 1, scores from Son	99		98	94	93	64	59	61	62	63	62	30	65	59	51
Procedure 2, scores from Father	97	97		97	94	62	59	61	62	64	63	30	65	59	51
Procedure 2, scores from Son	95	97	98		95	63	55	57	59	62	60	29	64	58	50
Ethnographic procedure (Eth)	77	73	79	74		70	54	56	58	61	61	32	69	61	52
Prestige (Pst)	37	29	36	25	64		37	38	39	40	42	33	51	45	33
Son's occupation															
Procedure 1, scores from Father	41	41	41	40	36	18		98	97	91	88	40	45	53	53
Procedure 1, scores from Son	42	42	42	41	35	17	98		98	93	92	46	48	55	55
Procedure 2, scores from Father	42	41	42	41	37	18	95	93		97	94	42	48	55	55
Procedure 2, scores from Son	43	42	43	43	37	16	93	94	97		95	44	51	56	56
Ethnographic procedure (Eth)	39	38	40	38	40	23	82	80	83	82		58	55	61	60
Prestige (Pst)	29	27	29	26	33	26	71	67	66	62	80		37	44	37
Father's education	41	39	42	40	48	34	28	27	28	28	32	27		69	51
Son's education	43	42	43	42	42	24	53	52	53	54	60	52	43		57
Wealth (Bolivia) or income (US)	30	29	31	29	31	18	41	40	43	42	48	40	22	39	
Means Bolivia	26	25	27	26	a	37[b]	32	30	34	32	a	39[b]	2	2	a
Means U.S.	42	43	39	38	a	41[b]	60	60	54	53	a	42[b]	8	11	a
Standard Deviations Bolivia	35	33	35	35	a	12[b]	35	33	36	35	a	11[b]	3.6	3.7	a
Standard Deviations U.S.	34	32	27	28	a	10[b]	28	25	23	22	a	12[b]	3.9	3.5	a

a. Not measured in comparable units.
b. Treiman's (1977) SIOPS prestige units, not comparable with other occupational scores.

APPENDIX C Correlations, means and standard deviations separately for pre-revolutionary, revolutionary, and post-revolutionary cohorts in Bolivia. (N=628, 271, and 169 respectively)

Variable and Cohort	F's Occ	F's Ed	Lang	Ed	Occup
F's Occ: Father's Occup. Status					
Pre-revolutionary	*	.69	.59	.63	.53
Revolutionary	*	.72	.52	.59	.44
Post-revolutionary	*	.65	.57	.61	.57
F's Ed: Father's Education					
Pre-revolutionary	.69	*	.54	.70	.48
Revolutionary	.72	*	.51	.70	.46
Post-revolutionary	.65	*	.50	.72	.49
Lang: Parents' Language					
Pre-revolutionary	.59	.54	*	.49	.40
Revolutionary	.52	.51	*	.40	.33
Post-revolutionary	.57	.50	*	.40	.24
Ed: Son's Education					
Pre-revolutionary	.63	.70	.49	*	.56
Revolutionary	.59	.70	.40	*	.56
Post-revolutionary	.61	.72	.40	*	.53
Occup: Son's First Occupation					
Pre-revolutionary	.53	.48	.40	.56	*
Revolutionary	.44	.46	.33	.56	*
Post-revolutionary	.57	.49	.24	.53	*
Means					
Pre-revolutionary	25	1.91	.40	2.22	31
Revolutionary	22	1.56	.36	2.51	27
Post-revolutionary	26	1.49	.38	3.15	30
Standard Deviations					
Pre-revolutionary	26	3.81	.49	3.75	25
Revolutionary	24	3.40	.48	3.47	22
Post-revolutionary	27	2.90	.49	3.70	23

Variables are defined in text.

FOOTNOTES

1. We use the term "peasants" broadly to include not only the ideal type "rural cultivators whose surpluses are transferred to a dominant group of rulers that uses the surplus both to underwrite its own standard of living and distribute the remainder to groups in society that do not farm but must be fed for their specific goods and services in turn" (Wolf 1966, pp. 3-4) but also farm laborers and other landless rural workers, small traders, and other members of the exploited rural masses.

2. We have in mind the notion that inequality is greater where differences between rich and poor are large and widespread, i.e. where the differences between one person and another are large on the average. The standard deviation is a familiar measure of this aspect of inequality and is now widely used to measure inequality in education, occupation and income (e.g., Jencks et al. 1972; Mincer 1974); it also links naturally with the formal theory that underlies our predictions. In the past, inequality was more commonly measured by the Gini or other coefficients based on the Lorenz curve. Like the standard deviation, the Gini is a measure of variance but it is based on the absolute value of the difference between individuals' scores rather than the standard deviation's squared difference; the two are comparable and monotonically related (Paglin 1975, p. 601). The Gini adjusts for differences in the mean while the standard deviation does not. Thus, for example, if everyone's income doubles the Gini is unaffected but the standard deviation is doubled. Doubling income also doubles the gap between rich and poor -- so a poor man has twice as large a gap to overcome if he is to live like a rich one and his son has twice the handicap -- and that increases inequality in a familiar and reasonable sense of the term. So we prefer a measure, like the standard deviation, that reflects such changes. With this exception, the choice of measure in practice makes no real difference. The correlation between the Gini and the corresponding measure based on the standard deviation, computed over the income distributions of 56 countries, is .84 (computed from Paukert 1973, Table 6); other popular measures are highly correlated with the Gini and so presumably with the standard deviation (Alker and Russett 1964, report correlations averaging .87 computed over various data of practical interest).

3. "Status inheritance" refers to a lack of pure (Yasuda 1964) mobility and we measure it by the product-moment correlation between father's and son's status. It focuses on the extent to which sons' status is influenced by fathers' status -- on the amount of rigidity in the status structure -- regardless of whether sons rise above their fathers or sink below them. If sons from high status families always maintain their advantage over sons from lower status families, there has been complete status inheritance even when all sons have higher (or lower) status than their fathers. This is the aspect of social mobility that interests us, an interest widespread in the field (e.g., Blau and Duncan 1967; Kelley and Perlman 1971; Treiman and Terrell 1975). To avoid confusion, we have not used the more general term "social mobility".

4. In exceptional circumstances, a revolution might even increase it, if physical capital played a minor role before the revolution and human capital had a greatly increased payoff afterwards. But that is unlikely in the predominantly peasant societies we are considering. Furthermore physical capital plays a major role in transmitting human capital from one generation to the next -- wealthy parents are better able to pay school fees and support their children while in school -- so economic redistribution will reduce the inheritance of human capital, which tends to decrease status inheritance; see equation (3) below.

5. Especially for the peasantry (tied to the land, they were usually subject to effective control and stringent restrictions) and residents of small rural towns (also subject to effective control) but less to residents of large urban areas and perhaps not at all for workers in large plantations and rural industries (revolution does not basically change their opportunity structure and their wages are often subject to political control afterwards).

6. In principle peasants might devote their new opportunities solely to leisure rather than accumulation, working only long enough to earn their customary wage. But in practice they are poor enough, and materialistic enough, not to do that; earlier claims that they would have been generally abandoned now that systematic data are available (Miracle and Fetter 1970).

7. The social and economic restraints which pre-revolutionary peasants created

to restrict inequality will in practice be eroded, if not destroyed, by revolution and the expansion of economic opportunities. In much of traditional Latin America, for example, the fiesta system effectively exchanged wealth for prestige, inhibiting the growth of economic inequality (Cancian 1965). As a man's career progressed he took on an orderly system of lesser fiesta offices which paralleled his growing power and influence, culminating in his fifties with a major political role in the traditional community government and sponsorship of a major and expensive fiesta. After the revolution peasants are usually unwilling to exhaust their savings in this way, in part because the economy provides alternative attractions but in part because the prestige obtained by sponsoring a fiesta declined. Much of the prestige came from the intimate association with power in the traditional political system and revolution breaks that down, creating new sources of power separate from the traditional offices and usually dominated by younger, more cosmopolitan leaders with little involvement in the fiesta system.

8. We measure inequality by the standard deviation (see footnote 2) and increasing everyone's income by some factor, k, also increases the standard deviation by k.

9. The standard deviation, our measure of inequality, is of course a simple function of the (squared) deviation from the mean. As peasants get closer to the mean, the deviation decreases and as they get further away from it it increases.

10. Inequality actually begins to increase somewhat before they reach the mean. As they improve their position, that will usually raise the mean for the society as a whole and poor peasants will then be further behind, which increases inequality.

11. These data are from the communist revolution in Poland. The correlation between father's and son's occupational status (dichotomized into manual/non-manual) in Poland was .63 for cohorts coming of age before World War II, .58 during the war, .43 at the beginning of the communist period, and .51 for later (1956-1968) cohorts (computed from Zagorski 1971; N = 3260).

12. This is somewhat offset by the increasing importance of education (i.e. increasing h) predicted by Hypothesis 2. In practice that is likely to be smaller than

the effects of σ_{fw} and σ_{fh}. It involves only half the terms in equation (3). Increasing h will also increase σ_{fw} (since it increases the returns the father gets from his educational resources) and the jobs for which education matters are a small fraction of the total in most peasant societies.

13. Without changing our conclusions, the aggregate could be any function which increases whenever any of its components increases and whose variance increases whenever any of their variances increase. Assume, plausibly, that having one resource (education, skills, motivation, ability, luck, etc.) does not systematically entail a loss of others, so that the correlations among resources are positive or zero. Then any (positively weighted) average of them, a multiplicative Cobb-Douglass function of them, and a variety of other specific functions all have the required characteristics.

14. The sum of $(1 + r + r^2 + \ldots + r^{n-1})$ is $(r^n - 1)/(r - 1)$, in general or $((1+save \cdot int)^n - 1)/(1+save \cdot int-1)$ in this case.

15. Both expressions are of the general form $a \cdot WEALTH + b + c \cdot (HUMANCAP+OTHER)$, where a, b and c are constants and WEALTH and (HUMANCAP+OTHER) are variables. The standard deviation of the sum is a function of the means and standard deviation of each variable and the covariance between them. We assume that inherited wealth is either positively correlated with human capital and other resources, or uncorrelated; it follows that wealth in the n^{th} year also has a positive or zero correlation. Hence the standard deviation will be an increasing function of a, of c, and of the variance in wealth, human capital and other resources. Since b is the same for everyone, it does not contribute to inequality in the n^{th} year (the time specified in equations 6 and 7) but it does contribute to inequality for the whole population. People who have worked for only a few years will have had only a few years to save but people who have worked for many years will have many years of savings and so more accumulated wealth; hence even an across the board increase in wages produces some inequality (Paglin 1974). This effect will, however, be small compared to the others and we ignore it.

16. We thank them for making these valuable data available.

17. There are 1,479 male heads in the town census which would make the sample 76% of the population. The census figure is an undercount since entire families were occasionally absent at the census time. But even allowing a pessimistic two hundred missing families still means the sample is just over two-thirds of the population.

18. Given the financial constraints and the original investigator's strong interest in community decision making in this male dominated society, the limitation is not unreasonable. Over two-thirds of the women are housewives or unpaid family farm workers.

19. We follow the Bolivian census's generous convention of considering only those with no schooling as illiterate.

20. We projected forward the age-specific illiteracy rates for 1950 (Republica de Bolivia 1955, p. 112) to the corresponding cohorts in our data and estimated rates for the younger cohorts by assuming that the secular decline (about 8% per decade since the turn of the century) continued.

21. Correlations among the variables with which we will be mainly concerned (education, occupation, father's education and father's occupation) differ in absolute value by an average of less than .02, under 4% of their value, while regression coefficients differ by even less.

22. Exact significance tests for weighted samples are not readily available but since we kept the adjusted N equal to the true one and the unweighted regression results are virtually identical to the weighted ones, the approximation should be very close.

23. The theory is generally that revolution affects inequality and that in turn is the cause of changes in the amount of status inheritance.

24. We factor analyzed a variety of measures of standard of living and constructed a factor weighted average of house size, number of servants, sanitary facilities,

floor type, and electricity. (The resulting scale is essentially identical to the one based on average years of education.). The scores are:

Elite white collar...100	Large farmer.....74
High white collar.....70	Cattle rancher.....70
Skilled modern blue collar.....64	Specialized farmer...31
Clerical & sales.....60	Specialized farm worker.....30
Small business.....56	Small farmer & farm worker.....0
Skilled traditional blue collar.....28	
Unskilled non-farm....28	

25. It does not require that the independent variables be continuous, even approximately; in fact it is often used with dichotomous (dummy) variables. In such uses it is mathematically identical to analysis of variance (e.g. Overall and Klett 1972, Ch. 17), a procedure which is commonly and correctly used for discrete variables.

26. We use conventional analysis of covariance procedures obtained by the use of interaction terms in ordinary least squares regression (e.g. Goldberger 1968). Since we are comparing two types of society, pre-revolutionary and revolutionary, we have adjusted the number of cases to be equal in the two periods; otherwise the results would be affected by the accident that our pre-revolutionary cohort is much larger than our revolutionary cohort. This was done by weighting the pre-revolutionary cases down to make the total number equal to the actual number in the revolutionary period, giving 542 cases in all; this is a conservative procedure since the calculations are then based on a smaller number of cases than we actually have. The model includes the variables of Table 1, age, and the appropriate interaction terms.

27. Unstandardized coefficients are, as is well known, more appropriate for comparing different periods since they are unaffected by differences in the standard deviations in the two periods. The standardized coefficients are however useful since they permit a comparison of variables measured in a different metric, e.g.

occupation and education, and many readers will find them more familiar. In practice the standard deviations in all three time periods are much the same, so standardized coefficients can be compared in different periods with little risk.

28. The distinction between direct and indirect depends on the model. Here we have a measure of education (which also serves as a reasonable proxy for some other forms of human capital) and so the effects that are indirect through education are explicitly measured. We have no comparable measure of physical capital, influence, or the like so the effects that operate through them appear as direct effects of father's occupation in our model, although they would appear as indirect effects in another model that had explicit measures of those variables. The inference that the direct effects of father's occupation reflect these rather than other unmeasured variables is, of course, somewhat problematic, although the argument for it is not unpersuasive (e.g. Kelley 1977). The calculation of indirect effects is straightforward here; the total effect of father's education, for example, is 1.3 in the pre-revolutionary period (line 7, column 1) but drops to 0.2 when son's education is included in the regression equation (line 7, column 4) and that drop of 1.1 (i.e. 1.3 - 0.2) is the indirect effect via son's education.

29. This is evident in Bolivia as the total effect of father's education is appreciable (line 7, columns 1, 2 or 3) but the direct effect is both substantively and statistically insignificant (columns 4, 5 or 6), indicating that there is no further advantage to having an educated father once son's level of schooling is fixed.

30. For this analysis we have weighted the revolutionary period down so it has the same number of cases as the post-revolutionary procedure which is conceptually correct but reduces the number of cases in both periods combined to a modest 338. The regression model includes the variables of Table 1, age, and appropriate interaction terms to perform the analysis of covariance.

31. I have omitted farmers since no status distinctions can be made among

them and their rank with respect to white and blue collar workers is unclear. Including them as blue collar, the best guess, leads to the same substantive conclusions as given in text.

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